PEER REVIEW MANUAL

2012-13

Peer Review Manual 2012-13

This manual is designed as a guide for Evaluation Group (EG) members for Research Grants Programs. It outlines activities to be undertaken by members and section chairs for each period of the year, and also describes the policies, guidelines and deliverables relevant to these activities. The manual is updated every year.

Most EG members are appointed from the Canadian academic community and are familiar with the Natural Sciences and Engineering Research Council's (NSERC) mandate, structure and programs. For new members appointed from other sectors, you may access an overview of these topics on our Web site. More detailed information can be found in the *Program Guide for Professors*.

Although we have tried to cover most topics, questions will certainly arise. These should be directed to your NSERC Program Officer or your section chair, who will be glad to help.

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1. Activities for June

1.1 Nomination of New Members to the Evaluation Groups

New Evaluation Group (EG) members are appointed every year in July. These members are approached regarding their willingness to serve on EGs, and their nominations are confirmed through an official letter from NSERC. To learn more about the selection of EG members consult:

- Appendix 1: Guidelines Governing Membership of Selection Committees and Panels

The appendices listed below contain a number of documents that should be read by all members of NSERC's Selection Committees, EGs or Panels:

- Appendix 2: Declaration for Members of NSERC Selection Committees
- Appendix 3: Guidelines on Conflicts of Interest

1.2 Roles, Responsibilities and Important Dates for EG Members

Acceptance of a term as an EG member brings with it a commitment to participate in the evaluation of applications assigned to an EG within guidelines established by NSERC and according to the customs/practices of that EG. Members must also adhere to NSERC's regulations on conflict of interest, communication with applicants and confidentiality.

The key activities that take place throughout the year are listed below; more detailed discussions are included in the relevant sections of this manual.

August/September

- Members review this manual and other documents sent by NSERC in preparation for meetings/discussions, information sessions and the competition.
- Members submit comfort ratings for the Forms 180 according to the instructions from the program officer.
- Members select referees for a subset of the Discovery Grant applications according to the instructions from the program officer.
- Members participate in the first of two orientation sessions for new EG members, as required.

November

- New EG members and chairs participate in the orientation session.
- Members participate in the EG competition preparation meetings/discussions (if applicable).
- Chairs participate in the executive committee meeting to finalize the assignment and/or transfer of applications to and from the EGs.

December-January

- Members read all of their assigned applications according to their role; either as first reviewer, second reviewer or reviewer.
- Members submit ratings in advance of the competition session (if applicable)

February

- Members participate in the evaluation meetings (three to six days).
- During the competition session, members prepare comments to be included in the Message to Applicant that reflect consensus of the discussion.

1.3 Extension of Your Discovery Grant

In recognition of the significant workload involved in the peer review process, NSERC allows some EG/selection committee/panel members and EG chairs to extend their Discovery Grant (at the same level) for the duration of their membership on the EG, selection committee, panel, or the Committee on Grants and Scholarships (COGS). The program officers will offer their members this option at the time they are being recruited for membership. If members do not take the option of an extension, their grant will be renewable at the end of its term, in competition with others, according to established guidelines on conflict of interest. The decision to extend a grant should be made before starting the first year of appointment on the committee or panel. To extend a Discovery Grant, the member must inform the program officer responsible for their committee or panel as soon as possible.

If members are scheduled to renew their award in a given year and are appointed to chair the EG that year, they may request to have their grant extended upon their appointment as chair.

1.4 EG Extranet

The EG Extranet is a password-protected area that allows members, section chairs and Group chairs to access protected information over the Internet and return information to NSERC. It is important that the information be managed in a secure fashion and used only for the purpose for which it was originally collected (i.e., to assess NSERC applications and make funding recommendations). Members will receive information on how to access the extranet.

- For help with access or technical problems, members should contact our Helpdesk at 613-995-4273 or webapp@nserc-crsng.gc.ca.
- For questions on the documents posted on the site, members should contact their program officer.

2. Activities for August

2.1 Preparing for Competition

2.1.1 Orientation Session for New Members (Part 1)

An orientation session for new members is held by teleconference, usually before the end of August or early September. The session is an opportunity for new members to ask questions and to familiarize themselves with the following items:

- NSERC's policies regarding:
  - Conflict of Interest;
  - Subject Matter Eligibility.

- The role of members regarding:
  - Comfort ratings;
  - Selection of referees.

- Extranet:
  - Access and purpose.

2.1.2 Peer Review Manual

The latest version of the Peer Review Manual is available for members before the end of summer. All members should read the manual and become familiar with the competition cycle, the list of activities and the policies and guidelines that apply to these activities. Members are encouraged to contact their program officer if they have any questions or concerns.

3. Activities for September

3.1 Posting of Information to the Extranet

In late August, or early September, NSERC will post important documents on the EG Extranet related to:

- policies and procedures;
- the review process; and
- the upcoming competition.

3.2 Assignment of Reviewers

Members will usually be asked to indicate, on a spreadsheet, their comfort or knowledge level of the area of the potential applications for a given year, e.g., H (high), M (medium), L (low), VL (very low), X (cannot review due to language proficiency) or C (conflict of interest). The program officer will provide each member with a spreadsheet containing information on each "Notification of Intent to Apply for a Discovery Grant" (Form 180). In most cases, this will be sufficient for members to determine their comfort levels. The full Form 180 is also available on the Extranet should the information on the spreadsheet not be sufficient for the member to make a reasonable estimate of comfort.

Using this list of potential applicants, or the Form 180s, along with the comfort ratings from the EG members, the program officer, in consultation with the section chair(s), assigns each application to the members who are the most appropriate to review the application (while balancing the workload). In selecting reviewers, attention must be given to possible conflicts of interest (see Section 6.7.1 for rules) and linguistic considerations.

As soon as possible, members must inform the program officer of:

- problems with the assignments, such as linguistic constraints (Form 180 indicates the intended language of the application) or a conflict of interest not previously apparent (family member, personal, etc.);
- an application that also covers areas where the reviewing EG has little or no expertise. In such cases it may be possible to have a joint review with other EGs so as to provide a more fair and complete review;
- any applications that members believe should be reviewed by another EG; and
- any applications that are perceived to fall outside of NSERC's mandate (i.e., research not in the natural sciences or engineering domain).

Note: Members may be asked to review applications that are not in their primary research field.

3.3 Referees

A thorough assignment of referees is critical to the success of the peer review process. This section outlines the general procedures and timetable for this activity.

Various documents/lists/spreadsheets will be made available on the Extranet to assist with the assignment of referees, including a referee databank and electronic copies of Form 180s submitted by applicants.

The first reviewer is responsible for selecting the appropriate referees from the applicant's suggestions on Form 180, the referee data bank and personal knowledge of the community (watching for conflict of interest and linguistic capability of prospective reviewers). Members provide the five most appropriate referees for each application by selecting from the list suggested by the applicant and blending those with their own suggestions. NSERC contacts the five referees identified by the reviewer.

Referees **must** have:

- appropriate expertise to comment with confidence; and
- linguistic skills to review the application.

Referees may be:

- from the industrial/private sector, as well as the university sector; and
- from Canada or abroad. The selection of noted international reviewers with suitable expertise is encouraged and should be given a high priority. In the case of established applicants, who may have many collaborators within Canada, international reviewers should be considered essential.

To avoid any conflict of interest, a referee should not:
(In the case of subatomic physics applications, please refer to the current internal procedures of the Subatomic Physics Evaluation Section.)

- be from the same institution as the applicant or any of the co-applicants;
- have been a research supervisor or graduate student of the applicant or any of the co-applicants, within the past six years;
- be providing letters of support for the application;
- have collaborated with the applicant or any of the co-applicants, within the past six years, or have plans to collaborate with them in the immediate future;
- be an employee of a non-academic organization with which the applicant or any of the co-applicants, has had collaboration within the past six years;
- be in any other potential conflict of interest (e.g., personal, financial).

Referee Selection

- Select the best possible referees for each application, i.e., those closest to the application's field and who are likely to provide a comprehensive, unbiased, critical review.
- Referees must not be assigned more than three proposals for review (NSERC does this verification before sending requests to referees).
- For interdisciplinary research, ensure that the referees selected have (individually or collectively) expertise in all the relevant disciplines and aspects of the proposal. If necessary, indicate on Form 180 which, and how many, referees should be approached to ensure a complete review.
- Use a good cross-section of referees, i.e., from young researchers to well-established ones, from academia and industry (where appropriate).
- Do not rely solely on the list of referees suggested by the applicant. Propose other referees.
- Include at least one of the referees suggested by the applicant, provided that he/she is suitable.
- Some applicants may request the exclusion of a specific researcher as referee on their application. You should consider these requests during the selection of referees, within reasonable limits. Contact the program officer if you have concerns about the appropriateness of the request.
- For each application, avoid suggesting more than one referee from a given organization.

All applications must receive a full and detailed evaluation regardless of the official language of presentation. On occasion, this may entail consultation with NSERC staff to identify referees with adequate linguistic capability.

3.4 Instructions on How to Complete and Submit Referee Suggestions

Attached at the end of this section is a sample of a completed Form 180. The encircled numbers refer to the following tips:

1. EG assignment: Form 180 is sent to the EG suggested by the applicant. The member assigned as first reviewer should advise the program officer of applications that should be considered for transfer to a more appropriate EG. Until this is confirmed at the November executive committee meeting, members should proceed with the selection of referees under the assumption that the application will remain with the EG.

   Reviewers should carefully select referees to ensure adequate coverage of all aspects of the proposed research. Clearly indicate if this would require more than five referees to be contacted.

2. Conflict of interest: In this case, Referee "E" was the applicant's supervisor at the doctoral and postdoctoral level. This referee should not be selected. The publication list attached to Form 180 may also help identify other situations of conflict of interest, such as collaborations. The applicant may have written to indicate that the application should not be refereed by a certain individual for various reasons; this should be taken into consideration. Refer to Section 6.7.1 of the *Peer Review Manual* for more information on conflict of interest.

3. Research topics and keywords relate to the proposed research. The Referee Databank may be searched in different ways (e.g., by referees, by research subject codes). NSERC Referee Databanks provides members with the following information for each referee: name, Personal Identification Number (PIN), address (department and university/organization), research subject codes, area of expertise and reading capability.

4. Verify the intended language of the application; it may not be the same as the language used for Form 180.

5. Identify the referees that should be contacted. If one of the referees is unable to do the review, you may be contacted to provide additional suggestions.

6. Once the referee suggestion spreadsheet is completed, it should be submitted to NSERC according to the instructions from the program officer.

Note: If a member discovers that the address given by the applicant or the one in our Databank is incorrect, they should provide the correct address to NSERC.

3.5 Form 180 – Notification of Intent to Apply for a Discovery Grant

See sample at the end of this section.

3.6 EG Membership

Replacement of members in the last year of their term should be discussed as early as possible. EGs should begin thinking about membership early in the competition year and continue over the following months. EGs may decide to create a section in September for the purpose of discussing membership and with the goal of completing the identification of potential new members by February. The chair or program officer will let members know how the EG will function in this regard and how one can contribute. NSERC encourages as many suggestions as possible. Potential new members can be established researchers or new scientists and engineers from large or small universities, and from government or industry. Potential candidates need not be NSERC grantees. In making suggestions for membership, one should examine the recent history and current membership of the EG. The program officer can provide this information.

For more details about the membership process, refer to Appendix 1.

3.6.1 EG Section Chairs

EG section chairs are appointed by NSERC in consultation with EG chairs and, as deemed appropriate, members of the EG and other members of the community. NSERC asks EGs not to make a formal recommendation for chair. Advice on potential chairs should be given to the program officer, team leader or director.

Natural Sciences and Engineering Research Council of Canada | Conseil de recherches en sciences naturelles et en génie du Canada

Date: 2010/08/13

Notification of Intent to Apply for a Discovery Grant

Avis d'intention de présenter une demande de subvention à la découverte

APPLICANT / CANDIDAT

Family name / Nom de famille	Given name / Prénom	Initial(s) of all given names / Initiale(s) de tous les prénoms	Personal identification no. (PIN) / N° d'identification personnel (NIP)
Doe	Jane	J	123456

Department / Département	Institution / Établissement
Ecology and Evolutionary Biology	University of Toronto

E-mail address / Adresse de courriel: j.doe@utoronto.ca

Degrees / Diplômes	Discipline / Discipline	Institution / Établissement	Supervisor / Directeur de travaux	Year / Année
Master's / Maîtrise	Integrative Biology	Guelph	George Harrison	2000
Doctorate / Doctorat	Molecular Population Genetics	Toronto	Paul McCartney (2)	2003
Postdoctoral experience / Expérience postdoctorale	Genomics/Molecular Population Genetics	Toronto	Paul McCartney	2003 - 2004

EVALUATION GROUP ASSIGNMENT / ASSIGNATION DU GROUPE D'ÉVALUATION

Suggest the number of the evaluation group you feel should review your application. / Entrez le numéro du groupe d'évaluation qui selon vous devrait évaluer votre demande.

1502 Biological Systems and Functions (1)

APPLICATION INFORMATION / RENSEIGNEMENTS SUR LA DEMANDE

Title of proposal / Titre de la proposition

Extent and Genomic Basis of Plant Adaptation

TYPE OF APPLICATION / TYPE DE DEMANDE

- Individual / Individuelle: [X]
- Team / Équipe: [ ]
- Subatomic Physics / Physique subatomique: [ ]

The application will be submitted in / La demande sera présentée en [X] English / anglais [ ] français / French (4)

Research topic(s) that describe the proposed research / Sujet(s) de recherche décrivant la recherche proposée

LSB01 - Plant Biology (3)

KEY WORDS that best describe the proposed research / MOTS CLÉS qui décrivent le mieux la recherche proposée

Evolutionary Genomics, Population Genomics, Floral Evolution, Quantitative Trait Loci, Coalescent Theory, Plant Mating Systems, Inbreeding, Deleterious Mutation

(3)

Personal Information Bank Number: SER/P-PU-095.
For information on the *Privacy Act*, consult the current NSERC *Program Guide for Professors*.

N° du fichier de renseignements personnels : RSG/P-PU-095.
Pour obtenir de l'information sur la Loi sur la protection des renseignements personnels, consultez le plus récent *Guide des programmes destiné aux professeurs* du CRSNG.

123456	Doe, J (Jane)

REFEREE SUGGESTIONS / EXAMINATEURS SUGGÉRÉS

Before completing the following section, refer to the instructions.

Referees **should be** capable of reviewing your application in the language in which it is written.

Avant de remplir la section suivante, consultez les instructions.

Les examinateurs **devraient pouvoir** étudier votre demande dans la langue de présentation.

BY THE APPLICANT PAR LE CANDIDAT	Area(s) of expertise Domaine(s) d'expertise	BY THE EVALUATION GROUP PAR LE GROUPE D'ÉVALUATION (5)
A Bungalow (Bill) Plant Evolution University of British Columbia CANADA	Plant Evolution, Floral Biology, Evolution of Development	**1** PIN / NIP: Lang.
B Rigby (Eleanor) Botany University of Saskatchewan CANADA	Local Adaptation, Genetics of Adaptation Population Genetics	**2** PIN / NIP: Lang.
C Hey (Jude) Botany Concordia University CANADA	Plant Specification, Evolutionary Genomics Population Genetics	**3** PIN / NIP: Lang.
D Lane (Penny) Biology University of Guelph CANADA	Plant Evolution, Genetics of Adaptation Speciation	**4** PIN / NIP: Lang.
E McCartney (Paul) Molecular Genetics (2) University of Toronto CANADA	Plant Mating Systems, Plant Evolution, Evolutionary Genetics	**5** PIN / NIP: Lang.

4. Activities for November

4.1 Orientation Session (Part 2) for New Evaluation Group (EG) Members

An orientation session is held in the fall for new EG members with the EG chairs, and program officers. The purpose of this session is to prepare new members for the competition by informing them of important NSERC policies and EG practices, and to give them an opportunity to ask questions. The program officer and the EG chair will present information on the following topics:

- **Competition Cycle** – An overview of the timetable of the Discovery Grants competition, with information on the responsibilities of EG members at different points in the cycle. Also covered will be the role of the program officers, program assistants and EG chairs.

- **Conflict of Interest** – NSERC's guidelines on conflict of interest, with tips on how to avoid potential conflict of interest situations.

- **Confidentiality** – Discussion on topics members that should and should not be discussed during tenure as an EG member during informal interactions.

- **Discovery Grant Programs and the Review Process** – An overview of the criteria and review procedures, including what to look for in various sections of the Discovery Grant application and the Personal Data Form; the use of referee reports, and the preparation of Messages to Applicants.

- **Calibration Session** – A mock review of select applications led by the section chairs. The objective of this session is to familiarize members with the competition process and the Discovery Grants Merit Indicators to have agreement and consistency among members on interpretation and use of the ratings.

- **Workload and organizing the review activities** – There is a large volume of material to review and handling it efficiently can save a lot of time and aggravation. Group chairs and section chairs will provide members with advice.

4.2 Assignment of Applications

4.2.1 General Principles

Applications are initially assigned to an EG according to the information submitted by the applicant. Program officers and/or members flag Form 180s where the full application

(Form 101 and Form 100) is required to assign it to an EG. These cases are discussed with the section chairs at the Executive Committee Meeting. Each member is responsible to assess the applications assigned to them

Fiction	Fact
Applicants apply to an EG.	Applicants apply to NSERC. As part of the application process, they will indicate which EG they believe is best suited to review their applications. NSERC verifies application assignments in consultation with members, section chairs and group chairs. Assignments are made on the basis of providing the best possible peer review.
An EG is expected to review applications in terms of their importance to the EG disciplinary themes.	Reviewers are expected to review an application in the context of its absolute Merit within the NSE.
An EG may reject an application because it does not fit within its disciplinary themes.	A member should advise NSERC if they think that an application may be improperly assigned or would particularly benefit from a joint review.

4.2.2 Executive Committee Meeting

A meeting with all group and section chairs (Executive Committee members) is held in the fall and is often in conjunction with the Second Orientation Session.
The objectives of this meeting are:

- **to verify the assignment of applications**– Section chairs determine if a joint review is necessary and, if so, they determine which members will be involved. Section chairs confirm the initial assignments arranged by program officers.

- **to discuss policy and procedures** – Section chairs are informed of policy and procedures which will assist them in guiding members through the calibration session and through competition. It is important to ensure consistent use of the merit indicators in the evaluation of applications, and to reliably enforce policy between sections.

4.2.3 Late Identification of inappropriately assigned applications

Any problem with assignment of applications should be brought to the program officer's attention immediately. Flagging such applications to the attention of the program officer, even during the competition session, is better than having it come to light when the application review begins. The early identification of an inappropriately assigned applications allows the opportunity to ensure a fair and thorough assessment.

4.2.4 Incomplete Applications

The onus is on the applicant to provide sufficient information, addressing the selection criteria, to allow peer assessment. Should NSERC staff determine, in consultation with the EG chair, that the information provided is insufficient, then NSERC may reject the application from the competition.

4.3. Assignment of Reviewers for Research Tools and Instruments (RTI)

RTI Grant applications are reviewed in different ways, depending on the type and number of applications and on the practices of the EG. The selection criteria are the same regardless of the mechanics used for the assessment. In some cases, the EG may form a section that reviews all RTI Grant applications on behalf of the EG. In other EGs, the applications are assigned to EG members as reviewers based on their areas of expertise, and all EG members participate in the deliberations. Normally, each
EG ranks each application, and the number of awards depends on the budget available each year.

The program officer will inform members of the process and will explain each participant's role. Members may be asked to evaluate RTI Grant applications and to submit ratings, rankings and/or partial funding recommendations ahead of the competition meetings.

Section 7 contains a detailed description of the review of Research Tools and Instruments Grant applications.

5. Activities for December and January

5.1 Posting of Applications, Samples of Research Contributions and Other Documents on the Evaluation Groups' (EG) Extranet

The following information will be available for members on the EG's Extranet site.:

- the instructions given to applicants on how to prepare an application;
- Discovery Grant (DG) applications (including samples of contributions);
- rating forms for Discovery Grant applications; and
- Research Tools and Instruments (RTI) Grant applications (if applicable);
- rating forms for Research Tools and Instruments Grant applications.
-
- Major Resources Support (MRS) applications(if applicable);

Members are required to examine their assignments and determine whether:

- they have a conflict of interest;
- they have the linguistic capability to review the proposal;
- the subject matter of the application is suitable for NSERC or more appropriate for another granting agency;
- the application is properly assigned for thorough assessment; and whether
- a joint review with another EG should be considered.

Members are asked to notify the program officer of any difficulty with the applications. Staff will consult with other EGs and arrange for joint reviews, as appropriate.

In early December, members will have access to the application material-.
Throughout January and February, referee reports will be accessible via the Extranet.

5.2 Travel Arrangements for the Competition Session

See Appendix 4: *Traveling on Behalf of NSERC* for details on arranging your travel for the competition session.

6.0 Discovery Grant Applications

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6. Discovery Grant Applications

6.1. Program Objectives

Discovery Grants assist in:

- promoting and maintaining a diversified base of high-quality research capabilities in the natural sciences and engineering in Canadian universities;
- fostering research excellence; and
- providing a stimulating environment for research training.

With respect to the first objective, diversity relates mainly to supporting research across the spectrum of natural sciences and engineering (NSE) disciplines. The renewal of research capabilities is also necessary and is achieved through guidelines for the support of early career researchers (see Section 6.6.2).

The objective of achieving a diversified base can sometimes be perceived to be in conflict with that of fostering excellence; however, to be successful, applications have to meet a minimum quality threshold.

6.2. Program Description

As NSERC's largest program, the Discovery Grants program is a major source of funding for NSE research at Canadian universities and constitutes the foundation of a large part of Canada's research effort. Discovery Grants are investments in both the research activities of individuals and groups working at the frontier of science and engineering, and the provision of stimulating environments for research training.

Recipients of Discovery Grants are not restricted to the specific activities described in their application and included in their budget proposal; they may pursue new research interests as they arise, provided these are within NSERC's mandate and adhere to the accepted use of grant funds documented in the *Financial Administration Guide*.

6.3. Nature of Research Supported

Research in the NSE encompasses a broad spectrum of activities. These activities range from investigations with no immediate or even mid-term application, as their importance stems from the intellectual structure of the discipline, to solutions to problems suggested by social and industrial needs. The Discovery Grants program is open to activities across the entire spectrum. The program aims to foster the full mix of activities that maintain Canada's university research establishments as healthy participants in world science and engineering, as a flexible resource for Canada and as favourable environments for the development of research personnel.

Researchers in health or social science-related fields: NSERC accepts that research in the NSE may lead to advances in the health, social sciences or humanities. To determine whether work contributes predominantly to the NSE or not, reviewers are asked to consider the tri-agency (NSERC, SSHRC and CIHR) policy entitled Selecting the Appropriate Federal Granting Agency. NSERC supports research programs that are first and foremost addressing research challenges, and clearly advancing knowledge and training, in the NSE. A research effort in the NSE that is a component of a larger program whose focus is outside NSERC's mandate does not qualify.

If you have any questions about subject matter eligibility, please raise this with your Program Officer. Eligibility decisions are the responsibility of NSERC staff.

6.4. Eligibility of Individuals

Eligibility decisions are the responsibility of NSERC staff. Evaluation Group members who have doubts as to a researcher's eligibility should review the application on the same basis as all others, but should alert NSERC staff to the potential problem(s) as soon as possible. The rules governing the eligibility of individuals can be found in the Eligibility section of the NSERC Web site.

6.5. Categories of Researchers

Researchers fall into two categories:

a) **Early Career Researchers** are applicants who are within two years of the start date of their first eligible position at the university (from July of the year of the application deadline) and who have no prior academic or non-academic independent research experience.

b) All other applicants are **Established Researchers**.

6.6. Evaluation of Applications

The evaluation of Discovery Grant proposals is based on the information contained in the applications and on a comparison to the entire research community in the discipline. The onus is on the applicant to submit a complete application and one that conforms to the presentation standards and instructions established by NSERC. Incomplete applications and applications that do not meet the presentation standards may be rejected by NSERC. Pages in excess of the number permitted are removed.

Discovery Grant applications are assessed on the basis of the following three selection criteria:

- Scientific or engineering excellence of the researcher;
- Merit of the proposal; and
- Contributions to the training of highly qualified personnel (HQP).

The assessment of each criterion is based on the achievements demonstrated over the past six years. Each criterion is important and has equal weight when determining the overall quality category (bin) for the application. The process for determining funding recommendations is separate and described in Section 6.7.2. The Discovery Grants Merit Indicators (see Section 6.11) contain statements, with reference to major points of consideration, to guide members towards arriving at a rating for each criterion. The evaluation of applications in subatomic physics may differ from these guidelines and is described in the current internal procedures of the Subatomic Physics Evaluation Section.

All applicants, both early career and established researchers, are to be evaluated using the same merit indicators.

Members are encouraged to use the full range of quality ratings, as appropriate, to achieve a distribution of ratings that reflects the quality of the applications being evaluated. Members are reminded that, during competition week, they will be expected to discuss and justify their ratings and then vote on a rating corresponding to the indicator that best reflects, on balance, their complete assessment of an application for a given criterion.

Members must guard against the possibility of hidden bias influencing the peer review. NSERC asks members to make every effort to review any application without bias, whether this bias is based on a school of thought, on fundamental versus applied research, certain sub-disciplines, areas of research or approaches, size or reputation of an institution, age, personal factors or the gender of the applicant(s).

Distribution of Ratings

The merit indicators are absolute in that they refer to the entire research community and are expected to be interpreted the same way from one competition year to the next. Ratings should reflect the quality of a proposal relative to the merit indicators. The worst application in a year of truly remarkable applications is not automatically given a rating of *Insufficient*. Similarly, the best application in a year where the overall cohort is not as strong is not automatically *Outstanding* or *Exceptional*. Evaluation Groups will calibrate their interpretation and use of the merit indicators through various opportunities prior to competition, including the fall Orientation Session.

With respect to the three separate criteria, it is expected that few applicants will be designated *Exceptional* from one competition to the next; this designation should be reserved for those individuals who have demonstrated and continue to demonstrate extraordinary achievements.

6.6.1. Selection Criteria

The merit indicators contain key points of consideration to rate an application on each criterion. These, and other points of consideration for each selection criterion, are discussed in detail below, together with important advice regarding the merit assessment.

6.6.1.1. Scientific or Engineering Excellence of the Researcher(s)

This criterion comprises several elements that consider the researcher's contributions to the NSE. Reviewers consider contributions made over the past six years. Ratings should always be reflective of the actual research experience of the applicant, taking into consideration any delays (see Section 6.6.3.1). For researchers with only a non-academic background in research and training (e.g., government or private sector), reviewers can consider the last 10 years.

The following elements are considered in the evaluation of the Excellence of the Researcher(s):

- Knowledge, expertise and experience of the researcher(s) in the NSE:
  - Stature in the field. Possible evidence includes awards and prizes received; invitations to lectures, write review articles and chair conference sessions; membership on committees, editorial boards and advisory boards; involvement in public outreach activities; and other less tangible recognition factors. Current stature should be assessed based on recent accomplishments described in the application and should be judged in the context of the applicant's research community.

- Quality of contributions to, and impact on, the proposed and other areas of research in the NSE:
  - Research accomplishments, as evidenced by the quality of recent contributions and overall level of contribution (impact) to research. Contributions may take the form of publications, conference presentations, patents and other methods of dissemination as appropriate to the type of research.
  - Assessment must be based on the quality and impact of all contributions, not only on the number of publications or conference presentations. The contributions submitted by the applicant are evidence of the quality of the applicant's work. Similarly, applicants should not be summarily disadvantaged for publishing in journals that are not familiar to the Evaluation Group. It must be demonstrated that past contributions have achieved maximum impact and reached the appropriate target audiences. In this context, impact does not refer to quantitative indicators such as the

impact factor of journals or h-index, but on the influence that results have had on other researchers, on the specific field, the discipline as a whole, or on other disciplines.

- Publications are often prepared jointly with students, postdoctoral fellows, other researchers, etc. The application should describe the applicant's intellectual contribution to collaborative work or joint publications. The assessment of "Scientific or Engineering Excellence" must fully take into account the overall quality and impact of collaborative activities.
- Impact can be in advancing knowledge, developing technology, or addressing socio-economic or environmental needs. All are valid, though the relevance of such considerations may differ depending on the discipline and the nature of the research being conducted.
- Applicants are provided an opportunity in the Most Significant Contributions section to discuss contributions made more than six years ago, but for which the impact is being felt now (e.g., exploitation of patent, inclusion in a code), may be considered.

- Importance of contributions to, and use by, other researchers and end-users:
  - This can be measured by the extent to which the applicant's work has advanced the field; i.e., created significant changes in thought within the research area and/or influenced the activities of users (including industry and the general public).
  - Contributions in the form of patents and technical reports, as well as involvement in the development of standards or codes of practice must be considered. For further details regarding contributions in engineering and the applied sciences, please see the Guidelines for the Preparation and Review of Applications in Engineering and the Applied Sciences.

- For team applications, the complementarity of expertise and synergy of the members of the team should be assessed:
  - To assess team applications, it is important to determine the expertise required to achieve the goals of the proposed research and evaluate each team member's potential to contribute to the research goals, their track record and the extent of their proposed contributions. The focus should be on the added value of combining the researchers' expertise and experience in advancing the common long-term goals and short-term objectives of the research program. All contributors (applicants and co-applicants) must be considered on the same footing; the applicant is simply the researcher responsible for administering the award. The ratings should reflect a group score and an assessment of the blend of individuals. The overall significance and impact of the team activities must be assessed and integrated in the evaluation of the application.
  - Funding recommendations for team applications are determined by the funding bin in which they are ranked, based on quality assessment. Where appropriate, Evaluation Groups can assess the Cost of Research factor as higher than would otherwise be the case, given that a larger program of

research can be carried out by a team rather than an individual. On the grounds of fairness toward research teams, Evaluation Groups may indicate to NSERC an appropriate and relative funding range at the time the application is reviewed. NSERC may adjust the grant amount accordingly, where appropriate, when funding recommendations are finalized at the end of competition.

6.6.1.1.1. Points of Reflection

Impact:

Contributions may take the form of publications, conference presentations, patents and other methods of dissemination as appropriate to the type of research. For example, a member's knowledge of a particular journal's review procedures may be helpful in assessing the quality of a publication. Venues with the highest impact (as measured by readership or attendance) may not be the most appropriate for an applicant's research results; it is up to the applicant to explain the choice of venues for dissemination.

When assessing an applicant's previous work, members are reminded to consider the relevance of their contributions to users from all sectors (i.e., academic researchers, industry and government researchers, policy makers and the public).

Collaborative Endeavours and Interdisciplinary Research – Increasingly, research on the most significant problems in science and engineering requires the combined knowledge, expertise and contributions of many researchers, often from various disciplines. Such collaborative and concerted activities should be actively encouraged through the Discovery Grants program, and reviewers should be particularly careful to give adequate credit to effective research interaction. Creativity and innovation are at the heart of all research advances, whether made individually or in groups. The role of collaborative and interdisciplinary work as a means to greater achievement in research must be fully valued by the peer review system. The indicators of achievement and excellence in interdisciplinary research, or in emerging areas, are often not as evident as those for research in the mainstream of a given field. Therefore, Evaluation Groups should recognize and appreciate the additional challenges inherent in interdisciplinary research.

Applied Science – Evaluation Groups that only have a small proportion of applied science applications will often be more familiar with the track record indicators used for "pure" science. They must guard against placing emphasis on "pure" science indicators of achievement and excellence, such as publications in refereed journals, and ignoring or de-emphasizing indicators of applied research achievements. See the Guidelines for the Preparation and Review of Applications in Engineering and the Applied Sciences for further details.

Previous grant amount – As per the recommendation in the Report of the International Review of the Discovery Grants Program, the amount of an applicant's previous grant is not the starting point for a new grant. Evaluation Groups must not consider an applicant's previous Discovery Grant amount as a measure of excellence.

6.6.1.2. Merit of the Proposal

A program of research must be of high quality to warrant support. It must be clear that genuine research problems in the NSE are addressed. The program must not be limited to the development of specific applications of existing knowledge; it must promise an original and innovative contribution. In assessing the merit of the proposal, the following elements should be considered:

- Originality and innovation:
  - To what extent does the proposal suggest and explore novel or potentially transformative concepts and lines of inquiry?

- Significance and expected contributions to research; potential for technological impact:
  - What will be the likely impact of the research? Will it advance knowledge in the field? Will it influence the direction of thought and activity?
  - Does the program show potential for a notable advancement or innovation in the discipline(s) or results of importance to a broad range of applications?
  - Will the results be appropriate for open dissemination to, critical appraisal by, and use in the research community or stakeholders?
  - In the case where the significance of the work depends upon the development of applications, are these general or limited to a particular user (firm, institution, etc.)?

- Clarity and scope of objectives:
  - Are there long-term goals as well as short-term objectives?
  - Is the relationship between short-term objectives and long-term goals clear?
  - Are the objectives specific, well-focused and realistic?
  - Has the application articulated goals of sufficient breadth and scope in line with a high quality research program?
  - Is there a vision of greater breadth and scope than simply plans and objectives?

- Clarity and appropriateness of methodology:
  - Does the proposal clearly outline the methodology to be used?
  - Is the proposed methodology current and appropriate (i.e., will it contribute to the stated research goals, has the applicant justified the methodological approach)?

- Feasibility:
  - Will the applicant's expertise and the proposed methodology allow the objectives to be reached within the proposed time frame?
  - Does the applicant have access to the necessary equipment and resources?
  - Has the applicant anticipated potential problems and proposed mitigating measures?

- Extent to which the scope of the proposal addresses all relevant issues, including the need for varied expertise within or across disciplines, where applicable:
  - Does the application sufficiently outline recent progress in research activities related to the proposal?
  - Has the applicant framed the research with appropriate reference to other relevant work in the field?
  - Do the research questions and proposed approaches include consideration of all appropriate areas of knowledge?

- Appropriateness of, and justification for, the budget:
  - Does the budget request relate well to the proposed methodology and expected results in terms of scale and feasibility of research plans (e.g., number of trainees in relation to available equipment/resources)?
  - Discovery Grants may only be used to pay the direct costs of research. Funds must not be used to pay for the indirect or overhead costs of research. More detailed information on eligible expenses is provided in the Use of Grant Funds section of the NSERC Web site. Eligible expenses for Adjunct Professors are discussed in section 6.6.3.2. Any concerns should be discussed with your Program Officer.

- Explanation of the relationship between the current proposal and research supported by other sources of funding; and the extent to which it is clear:
  - Is there a clear explanation of the conceptual and budgetary relationship between the proposed work and the applicant's research programs funded by other grants? Is there any conceptual or budgetary overlap?

6.6.1.2.1. Relationship to research supported by other sources of funds

NSERC encourages researchers to obtain funds from other sources, but does not allow duplication of funding for the same research.

The relationship to research supported by other sources of funds is considered within the "Merit of the Proposal" criterion. The availability of other sources of funding should not systematically lead to a lower or higher assessment of the "Merit of the Proposal." As long as the applicant explains clearly the relationship between the research being supported with these funds and how it is distinct from that which will be supported with the requested funding, and as long as the contributions to the NSE field described in the research

proposal are commensurate with the funds requested, the availability of other sources of funding should be viewed positively.

The principles to assess overlap with other sources of funds are as follows:

- NSERC supports research programs that are first and foremost addressing research challenges, and clearly advancing knowledge and training, in the NSE. A research effort in the NSE that is a component of a larger program whose focus is outside NSERC's mandate does not qualify. Proposals that include the use of methodologies, tools, techniques and knowledge from the NSE to address questions or issues related to health science or a social sciences or humanities should be submitted to CIHR or SSHRC respectively.
- Access to Discovery Grant funds should be fair for all eligible researchers, regardless of other sources of funding. This is also true for researchers who receive funding from other NSERC programs.
- All applications are to be evaluated according to the three selection criteria.
- There are two types of overlap: conceptual and budgetary:
    - Conceptual overlap: conceptual overlap occurs when the ideas in the proposal are, or appear to be, the same ideas that are funded by other sources. However, complementary parts of the same NSE research program can be supported from different sources. Applicants should make clear which aspects make up the discovery program of research and what differentiates these aspects from activities supported through other grants. In other words, the applicant should clearly differentiate between the program of research covered by the Discovery Grant and other research programs or projects supported from other sources.
    - Budgetary overlap: applicants should explain how funding received from various sources is being used. The Discovery Grant is a grant-in-aid and usually does not pay for the entire research program. It is expected that other sources of funding will be required and the applicant should make it clear how these funds are being used.

The onus is on the applicant to provide information on the relationship (conceptual and budgetary), between the proposed research and other research for which support is held or sought. The applicant must also explain perceived duplication in funding or, if applicable, indicate how the NSERC application complements research funded by other sources. For each grant currently held or applied for, applicants must clearly indicate the main objective, a brief outline of the methodology, budget details, the support of highly qualified personnel and the relationship to the NSERC application. Such information may be provided as a brief summary of the necessary details for each grant and attached as additional pages to the budget page of Form 101.

If an applicant fails to provide adequate information to assess the relationship between the proposed research and other research currently being done or for which support is being sought, members may recommend a lower rating for the "Merit of Proposal"

criterion. Reviewers should consult the tri-agency policy entitled Selecting the Appropriate Federal Granting Agency.

6.6.1.2.2. Points of Reflection

Program versus Project – The Discovery Grants Program supports ongoing programs of research (with long-term goals) rather than a single short-term project or collection of projects. If projects are defined without being placed in the broader context of a program, the indicators show that a rating of *Insufficient* is warranted. The issue of whether the request is for support of a program or a project can be examined in the context of the "Merit of Proposal" criterion when evaluating the "Clarity and Scope of Objectives" (e.g., long-term goals as well as short-term objectives), and the "Significance and Expected Contributions to Research."

Creeping Conservatism versus Risk Taking – Members should be open to new research problems and innovative approaches, and should focus their discussions on whether the problems addressed are challenging, interesting and could potentially have a transformative impact on the field, and whether the methodologies proposed could yield new and useful knowledge. In any peer review system, there is a risk towards conservatism or excessive caution. In light of the limited availability of program funds, this can manifest itself as a failure to recognize innovation and outstanding potential in a researcher or unwillingness to take risks, particularly if the research area is not well known to the reviewer.

Biases – There is always concern that an Evaluation Group may exhibit a bias, whether this bias is based on a school of thought, fundamental versus applied research, certain sub-disciplines, areas of research or approaches (including emerging ones), size or reputation of an institution, age, personal factors or gender of the applicant(s). NSERC cautions members against any judgment of an application based on such factors, and it asks them to constantly guard against the possibility of hidden bias influencing the decision-making process.

Interdisciplinary Research – Proposals that relate to interdisciplinary endeavours may appear somewhat unfocused when compared with other applications. Evaluation Groups are asked to take this into account when assessing interdisciplinary applications, as well as to keep an open mind to the practices and methodologies of disciplines other than their own.

Capacity to Undertake the Proposed Activities – The proposed research activities and the related budget justification should be considered relative to the applicant's capacity to undertake the planned program given their commitments in other research endeavours, as presented in the application (Form 101 and Form 100).

6.6.1.3. Contribution to the Training of Highly Qualified Personnel

The Training of Highly Qualified Personnel (HQP) is an essential criterion for the Discovery Grants program. Contributions to quality training at all levels, including undergraduate and graduate students, postdoctoral fellows, technicians and research associates are valued.

It is not sufficient for a researcher to have a solid track record of research contributions and propose a worthy research program. For a meritorious rating, the application must convince reviewers of the impact and quality of research training activities. Assessment of contributions to training of HQP includes both the record (past) and the plans for future training.

In assessing Contributions to the Training of HQP, the following elements should be considered:

- Quality and impact of past contributions to the training of HQP during the last six years:
  - Training supported by NSERC ranges from undergraduate theses and summer projects to postdoctoral levels, and includes technical and other research personnel. Contributions to training must not be assessed solely in terms of the number and level of individuals supervised; it must be assessed in terms of its quality and impact. The suitability of the HQP contributions need to be considered in context of its suitability for the research program. The level and content of supervision or co-supervision should have been suitable for the research program. Applicants must provide details regarding their role as co-supervisors. Contextual information provided by the applicant will be used during the evaluation process only to assess the suitability of the research proposed and HQP plans. Ratings should not be adjusted based on the context of the research environment.
    - It is usually unacceptable for an established researcher to have no training record; however, an exception could be made in the case of delays that are beyond the control of the applicant. See section 6.6.3.1 for more information on delays.
    - It is expected that effective training of HQP results in completion of degree requirements within a reasonable amount of time. A pattern of prolonged periods of study or frequent student withdrawal from programs should be explained by the applicant. Committees must be careful to acknowledge delays that are beyond the control of the applicant, such as parental leaves by trainees. If provided, this should be taken into consideration when determining an appropriate rating for this criterion.
  - The training of HQP is expected to have lead to high quality contributions to knowledge:
    - Evidence that past HQP have collaborated in research contributions (conferences, publications, patents, technical reports, etc.), usually as

co-authors, is to be considered an indicator of their intellectual involvement and success. The quality of such contributions should also be taken into account, where appropriate. The onus is on the applicant to explain the involvement of trainees in past activities.

- HQP are expected to move on to careers related to the fields of science and engineering, whether as professionals in the private or public sectors or academia:
  - The pursuit of further studies by former HQP, or employment in any sector related to the NSE, can be considered evidence of the quality of their training.
- A researcher's involvement in science outreach activities (e.g., general outreach activities and/or NSERC-funded activities) should also be recognized as a valuable contribution to research and training.

- Appropriateness of the proposal for the training of HQP in the NSE:
  - Discovery Grants are intended to support programs of research rather than single projects. It is expected that applicants describe how the training of HQP will fit into the proposed program of research. This may be accomplished by describing projects for HQP within the program of research.
  - The appropriateness of a proposed plan to train particular trainees should be considered; i.e., is the project suitable for an undergraduate student, a master's student or a PhD student?
  - For technicians and others who are in long-term positions, the applicant should explain how the work will contribute to the development of new skills or knowledge.
  - The capacity of the researcher to supervise the proposed number and type of HQP should be considered.
  - It is expected that HQP be intellectually involved in the research program.
    - The proposed research should leave room for growth and development; HQP should not simply be extra hands for the researcher.
  - For an established researcher with no intent to train HQP, the rating for this criterion should be *Insufficient*. Applicants must provide justification if training of HQP will be limited with respect to the proposed research program. The justification should be taken into consideration by the Evaluation Group when determining an appropriate rating for this criterion.

- Enhancement of training arising from a collaborative or interdisciplinary environment, where applicable:
  - The quality and extent of interactions and collaborations, with respect to the resulting effect on training of HQP, should be taken into consideration.
  - Opportunities for interaction with the private and public sectors (e.g., industry, government agencies) should also be considered.

- Some researchers participate in co-supervision arrangements to increase the interdisciplinary nature of the training experience.

6.6.1.3.1. Points of Reflection

Researchers with Non-Academic Background – For researchers with a non-academic background in research and training (e.g., government or private sector), research training experience can be considered over the last ten years.

Names of Trainees in Form 100 – NSERC requires applicants to obtain consent before including the names of trainees in Form 100. As this is not always feasible, applicants can provide information on trainees without providing names. This information, though more generic, should be sufficient to enable the reviewers to consider the above-mentioned points. However, every effort should be made to include names where feasible.

HQP Training in non-NSE Domains – Proposed training under the Discovery Grant plan must be in the NSE domain. However, HQP training in other domains (e.g., health, social sciences) may be considered as part of the demonstrated commitment of the applicant to training and the quality of the training environment, particularly when there have been opportunities for training synergy or interdisciplinary training.

6.6.2. Early Career Researchers

NSERC is committed to supporting early career researchers (ECRs) who have the training and expertise to make valuable research contributions in the NSE fields.

All applications are evaluated against the same expectations for the three selection criteria.

Following the evaluation of all applications, the Executive Committees will aim to support at least 50 percent of early career applicants, subject to the assurance of high quality and may establish a lower quality cutoff for this group. NSERC considers it important to allow early career researchers to demonstrate their potential for quality contributions to research and training. Funding levels for like-rated early career or established researchers are expected to be similar. The duration of funding would normally be for five years, to allow sufficient time for the applicant to demonstrate research excellence.

As ECRs are being evaluated using the same rating scale as established researchers, it is expected that they will not normally be rated in the range of *Outstanding* or *Exceptional*.

ECRs should not be rated as *Insufficient* due solely to the fact of not having a training record; the review can focus on the plan for future training. At the same time, it is unacceptable for an established researcher to have no training record.

ECRs who continue to collaborate with previous supervisors, or who carry out research as part of a group, should clearly define their contributions to the collaborative work.

6.6.3. Special Considerations

All applicants are evaluated against the same expectations in terms of the quality of the contributions that have been, or will be, produced. There are, nonetheless, circumstances which require careful consideration by members during the evaluation of Discovery Grant applications. The most common ones are listed below.

6.6.3.1. Delays in Research and Dissemination of Research Results

In the instructions applicants are asked to explain and give dates for any significant delays in the research activity or in the dissemination research results (e.g., parental leave, bereavement, single parent situations, illness, or other circumstances beyond the applicant's control).

NSERC recognizes that research productivity and contributions to the training of HQP may be disrupted during periods of pregnancy or early child care (parental leave), or as a result of special circumstances. In these cases the applicant's productivity would be assessed over the active period (i.e., excluding the period of leave).

Members are asked to be sensitive to the impact of these circumstances on the level of productivity while ensuring that the quality of research programs supported by NSERC remains competitive.

6.6.3.2. Adjunct and Emeritus Professors

It is NSERC's policy to recognize and support the important role played by adjunct and emeritus professors in university-based research and research training at Canadian universities. Adjunct and emeritus professors are required to submit Appendix C of Form 100, addressing their research and training activities, which is intended to help committees assess the commitment of these professors to their university research and training activities.

Applications from Adjunct and Emeritus professors are evaluated using the same criteria, scale, indicators and timeframe (past six years) as all other applicants. Where

the terms of an individual's appointment do not permit sole supervision of HQP, it is expected that a satisfactory plan for co-supervision will be presented and clearly described in the application.

The onus is on the applicant to provide sufficient information to enable Evaluation Groups to assess this appropriately (e.g., does the university require co-supervision of HQP? What interactions with HQP are possible?).

In the case of adjunct professors with a position in industry or government, NSERC will normally award funds only for the direct support of students (salaries or stipends and student travel costs). Members should bring to the attention of the Program Officer any application where other types of expenses are being proposed.

Members should also be aware that not all adjunct professors have other positions in industry or government. In such circumstances, regular expenses may be eligible.

6.6.3.3. Evaluation Group Members

Researchers who hold a Discovery Grant when they are appointed to an Evaluation Group are given the option of extending their grant at the same level for the duration of their membership (see Section 1.3). However, if a member elects to submit an application as scheduled, the member's application will normally be reviewed at the end of the Evaluation Group's review of Discovery Grant applications and in the presence of a Group chair or senior NSERC official. Arrangements will be made to ensure that the member does not learn the identity of the internal reviewers. The member will be informed of the Evaluation Group's recommendation and of NSERC's decision through a Notification of Decision letter according to the usual process for all applicants. Special arrangements should be made with the Program Officer if the Section chair is an applicant in the competition.

6.6.4. Relative Cost of Research

In addition to the selection criteria discussed previously, applications are also assessed with regard to the cost of the proposed research, relative to the normal costs in the discipline. The "Cost of Research" relates to individual circumstances, but in the context of an area of research. These costs can include special needs related to the nature of collaborative activities or infrastructure costs such as user fees. Evaluation Groups will collectively determine the parameters for considering the cost of research. Members will be asked to first gauge the budget in terms of justification, and then to rate the relative cost of the proposed research program (High, Normal, Low) as compared to the norm for the research areas represented in the applications considered by the Evaluation Group(s).

The merit indicators for the "Relative Cost of Research" can be used by members to arrive at a rating. It is expected that the majority of applications will be deemed to have normal costs of research. While some applicants might have higher costs of research in one budget category, these may be lower in another, leading to an overall assessment of a Normal relative cost for the research program.

Factors to consider include:

- Salaries and benefits (e.g., extent of stipend support, trainee level)
- Equipment and/or facilities (e.g., need for equipment, access to facilities)
- Materials and supplies (e.g., type and extent of consumables)
- Travel (e.g., collaborations, field work, conference attendance):
    - In consideration of the costs associated with travel, the appropriateness of the proposed travel should also be judged. For example, above average attendance at conferences may be disregarded if attendance is unsubstantiated by the research program.
- Dissemination:
    - Charges associated with dissemination may include charges for publications (per page or reprints), conference fees and fees associated with the preparation of technical reports and filing of patents.
- Other:
    - Special costs related to the proposed work can also be considered.

The appropriateness of and justification for the funding requested is considered within the Merit of the Proposal not the Relative Cost of Research.

6.6.5. Discovery Accelerator Supplements

The Discovery Accelerator Supplements Program (DAS) provides substantial and timely additional resources to accelerate progress and maximize the impact of superior research programs.

Awards are determined by Evaluation Groups in a two-step selection process. First, while reviewing Discovery Grant applications, Evaluation Groups nominate applicants whose research proposals suggest and explore novel or potentially transformative concepts and lines of inquiry, and are likely to have impact by contributing to groundbreaking advances in the area. The timeliness of DAS support represents the potential for the researcher at this time to capitalize on an opportunity, such as a recent research breakthrough, a paradigm shift or a new strategy to tackle a scientific problem or research question.

In the second step, after the evaluation of Discovery Grant applications is concluded, the Executive Committee for each Evaluation Group conducts a final analysis of the DAS nominees to select those who best meet the objectives of the DAS Program, within the quota of DAS awards allocated to the Evaluation Group. The quotas are determined based on proportional representation and are also based on research conducted in strategic areas.

Universities, through their Vice-President of Research, are allowed to request a reduction in the duration of the Discovery Grant for a limited number of researchers from their institution who they believe would best meet the objective of the DAS Program. This is to allow some of the very best researchers the possibility of being nominated for a DAS earlier than their normal Discovery Grant duration would have allowed. These applications should be reviewed as all others, and only be put forward for a DAS if they meet the objectives of the program.

6.7. Policies and Guidelines

6.7.1. Conflict of Interest

The final decision on conflicts of interest rests with NSERC.

A conflict of interest is deemed to exist in the following situations:

- a member is the applicant, co-applicant or co-signer;
- a member is, or was in the last six years, from the same university, organization or department, or belongs or belonged, in the last six years, to the same research unit as the applicant(s);
- there is an administrative or family link between the member and the applicant(s) (e.g., head of the department, dean of the faculty);
- an industrial or government representative on a committee is, or was, in the last six years directly involved in collaborative activities with the applicant(s);
- a member is a former research supervisor or graduate student of the applicant(s) or has collaborated or published with the applicant(s) within the past six years;
- the member is uncomfortable with reviewing the proposal due to previous conflicts or any other reason (e.g., past student or supervisor, even if more than six years ago, or personal, financial conflict); or
- NSERC staff have reason to believe that a specific member should not be involved in the review.

NSERC guidelines require that:

- the member must not be assigned the application for review; and
- the member must leave the room before discussion of the application without commenting and not participate in any discussion pertaining to the application.

The members must notify the Program Officer of all conflicts of interests. If an applicant is a family member (or someone especially close to them); extra steps will be taken to ensure the confidentiality of reviewers. Conflicts arising from adjunct positions or from individuals belonging to a large regional or national network should be discussed with the Program Officer. Conflicts of interests can be declared at any time.

6.7.2. Framework for Funding Recommendations

The review of Discovery Grant applications and the recommendation of grant amounts occur in two separate steps. In the first, the Evaluation Group performs a merit assessment of each application on the basis of the selection criteria and evaluation indicators (see Section 6.6). In addition, the Evaluation Group determines whether the proposal has normal, lower than normal or higher than normal associated costs of research relative to others in the field (see Section 6.6.4). In the second step, once all applications have been evaluated and their ratings established, applications that have the same overall rating are grouped in a funding bin. The combination of an applicant's ratings for the three criteria determines the overall rating and the funding bin. Final recommendations for budget distribution within an Evaluation Group are made by the Executive Committee in consultation with NSERC staff. The Evaluation Group Executive Committee is comprised of the Group Chair and the Section Chairs.

The Executive Committee may have to make difficult choices with respect to recommending funding within the budget of the Evaluation Group. It may consult the Evaluation Group on the strategy that would guide such choices. This consultation should take place prior to the Executive Committee's deliberations, preferably in advance of the competition session.

With each competition, bin values can change somewhat based on the final bin distribution of applicants and the available budget, but to ensure consistency among cohorts the starting bin values at the beginning of the competition are reset back to the pre-established reference values for the EG. The amounts for applications falling in Bin A, receiving ratings of *Exceptional* for all selection criteria, represent a minimum grant amount and may require specific funding recommendations from the Executive Committee. This provides the flexibility to award higher levels to researchers truly performing at the highest levels internationally, if warranted. Applicants will not be awarded more than the requested amount regardless of the funding level assigned to each bin.

6.7.3. Duration of Grants

The normal duration of a Discovery Grant for all applicants is five years.

A rating of *Moderate* for the merit of the proposal will normally result in a one-year award.

Grants of shorter duration can also be recommended on a case-by-case basis. During discussion of a particular application for which concerns have been identified in one or more of the criteria, an Evaluation Group can vote on the duration for which a grant would be made, should it fall within a "fundable bin." Members should note that when a one-year award is recommended, the applicant will have about six months to address any problems noted by the Evaluation Group, before submitting a new application.

6.8. Time Commitment

A member's preparation for the February competition session involves the following:

- Reading in-depth those proposals on which you are an "internal reviewer";
- Complementing your assessment by reading the samples of contributions provided;
- Reading all other applications that you have been assigned to as a "reader" so that you will be able to participate in the discussions and vote;
- Integrating comments made by referees into your assessment;
- Identifying DAS candidates;
- Preparing notes on applications, particularly those on which you are an internal reviewer, using the rating form provided by NSERC, if desired;
- Arriving at a preliminary rating for each of the three selection criteria;
- Arriving at a preliminary recommendation for the cost of research (High, Normal, Low) and, where warranted, for the duration of funding;
- Preparing draft comments for the Message to Applicant for cases where you recommend a rating of *Moderate* or *Insufficient*, or where a message would particularly benefit an applicant; and
- Providing your ratings to NSERC staff in advance of competition week, if required.

The time required for this preparation is substantial and will vary according to the Evaluation Group workload and the workload of the individual member.

You should set a schedule in advance of the competition that allows for a thorough review of all applications, recognizing that a more in-depth analysis is required for first and second internal reviewer assignments. NSERC asks members not to discuss any application with other Evaluation Group members outside the time allocated for its review during competition (not prior or after competition, and not during competition outside the formally allocated time).

6.9. Deliverables

6.9.1. Integration of Referee Comments and Past Message to Applicant

External reviewers, or "referees," help provide a deeper overall assessment of an application. Referees may be familiar with a particular research area or technique and may be able to comment on an applicant's contributions to the field. Evaluation Groups should focus on the content and credibility of referee reports as inputs into the evaluation process, but **must ultimately base their recommendations on their own relative assessment.** External referee reports contribute to these assessments, but must not be used on their own to either accept or reject a proposal (see Section 6.9.2. on preparing the Message to Applicant). Evaluation Groups should be sensitive to any real or perceived conflict of interest or relationship between the referee and the applicant(s) that might influence the review (e.g., professional interactions, potential competition). These should be brought to the attention of the Program Officer and, if needed, addressed in the Message to Applicant. Evaluation Groups should also recognize that the background of a referee might influence the review (e.g., school of thought bias, lack of familiarity with the Canadian research funding environment).

In cases of returning applicants who were unsuccessful in the past, received an award of shorter duration, or where ratings of *Moderate* or *Insufficient* were awarded in previous competitions, the previous Message to Applicant may be shared by the Program Officer with the Evaluation Group members, at the end of the Evaluation Group discussion. This is done only when there is a need to ensure that the current Evaluation Group is not sending confusing or contradictory messages to the applicant. The Evaluation Group may comment on issues raised previously that have or have not been addressed adequately in the current application.

6.9.2. Preparing the Message to the Applicant

There will be little opportunity to prepare careful and constructive comments (for inclusion in the Message to Applicant) during the competition session. Consequently, in advance of the competition, internal reviewers should prepare draft comments (or keep a record of personal notes which highlight the strengths and weaknesses of the application) to applicants if they anticipate these being required. In February, when applications are reviewed by the Evaluation Group, these comments should be discussed and carefully vetted. The final version of the Message to Applicant form provided to NSERC must reflect the Evaluation Group's consensus. The rating form is an excellent tool on which to base the formulation of balanced and helpful comments.

Constructive comments are of vital importance to enable researchers to improve future applications and/or their research programs. Evaluation Groups are asked to

provide specific and constructive comments to applicants especially in the following cases:

- Rating of *Moderate* or *Insufficient* on any criteria;*
- Recommended grant duration is less than five years;*
- NSERC instructions have not been followed (e.g., font size, reporting of HQP, page limits); and
- A referee report is perceived to be particularly biased, and the members wish to reassure the applicant that it did not influence the evaluation.

* NSERC requires comments in such cases.

Evaluation Groups should comment primarily on those aspects of a proposal that were important in arriving at the Evaluation Group's recommendation. Both strengths and weaknesses are appropriate for comment (for inclusion in the Message to Applicant). The comments should also address any apparent discrepancy between the Evaluation Group's recommendation and the referee reports in order to provide a clear understanding of the Evaluation Group's assessment. The comments should explicitly discuss specific points in external referee reports with which the Evaluation Group particularly agrees or disagrees, if these are a factor in the final recommendation. The Message to Applicant must be in accordance with NSERC guidelines and appropriate for transmission to the applicant. If at all possible, the Evaluation Group should write the comments in the applicant's preferred language. If not possible, it will be translated following deliberations.

The following are examples of problems sometimes encountered in Messages to Applicants prepared by Evaluation Groups:

- Lack of clarity (e.g., it is not clear what message the Evaluation Group is trying to send);
- Message too general to be of use (i.e., "applicant did not rate as highly as others in the competition");
- Abusive or belittling language; and
- Messages which appear to be inconsistent with external referees' comments without acknowledging those comments and explaining the Evaluation Group's rationale.

In the past, there have been appeals based on the applicant's perception of an age or gender bias in the recommendation of the Evaluation Group. Members must make sure not to introduce such biases in the review process and that the comments conveyed to the applicant do not imply that there were such biases.

6.10. Rating Form – Discovery Grant Applications

The rating form provided by NSERC is an excellent aid for reviewing applications (see Rating Form – Discovery Grant Application; a form-fillable version is available on the extranet). The rating form focuses on the evaluation criteria and allows you to integrate, where appropriate, external referee comments and any other relevant information (e.g., delays in research). Although the rating form is only provided as a tool, and will not be collected by NSERC, using it will help you to ensure that you take all criteria into account when formulating your preliminary ratings. Once completed, rating forms should be treated as protected information.

6.11. Discovery Grants Merit Indicators

6.13. DISCOVERY GRANTS MERIT INDICATORS[1]

	Exceptional	Outstanding	Very Strong	Strong	Moderate	Insufficient
Excellence of the Researcher	Acknowledged as a **leader** who has continued to make, over the last six years, **influential accomplishments** at the highest level of quality, impact and/or importance to a **broad community**.	The accomplishments presented in the application were deemed to be **far superior** in quality, impact and/or importance to a **broad community**.	The accomplishments presented in the application were deemed to be of **superior** quality, impact and/or importance.	The accomplishments presented in the application were deemed to be **solid** in their quality, impact and/or importance.	The accomplishments presented in the application were deemed to be of **reasonable** quality, impact and/or importance.	The accomplishments presented in the application were deemed to be **below an acceptable level** of quality, impact and/or importance.
Merit of the Proposal	Proposed research program is clearly presented, is **extremely original and innovative** and is **likely to have impact by leading to groundbreaking advances** in the area and/or **leading to a technology or policy** that addresses socio-economic or environmental needs. **Long-term vision** and **short-term objectives** are **clearly defined**. The methodology is **clearly defined and appropriate**. The budget **clearly demonstrates** how the research activities to be supported are distinct from and complement those funded by other sources.	Proposed research program is clearly presented, is **highly original and innovative** and is **likely to have impact by contributing to groundbreaking advances** in the area, and/or **leading to a technology or policy** that addresses socio-economic or environmental needs. **Long-term goals are clearly defined and short-term objectives are well planned**. The methodology is **clearly described and appropriate**. The budget **clearly demonstrates** how the research activities to be supported are distinct from and complement those funded by other sources.	Proposed research program is clearly presented, is **original and innovative** and **is likely to have impact by leading to advancements** and/or addressing socio-economic or environmental needs. **Long-term goals are defined and short-term objectives are planned**. The methodology is **clearly described and appropriate**. The budget **demonstrates** how the research activities to be supported are distinct from and complement those funded by other sources.	Proposed research program is clearly presented, is **original and innovative** and is **likely to have impact** and/or address socio-economic or environmental needs. **Long-term goals and short-term objectives are clearly described**. The methodology is **described and appropriate**. The budget **demonstrates** how the research activities to be supported are distinct from and complement those funded by other sources.	Proposed research program is clearly presented, has **original and innovative aspects** and **may have impact** and/or address socio-economic or environmental needs. **Long-term and short-term objectives are described**. The methodology is **partially described and/or appropriate**. The budget **demonstrates** how the research activities to be supported are distinct from and complement those funded by other sources.	Proposed research program, as presented, **lacks clarity** and/or is of **limited originality and innovation**. **Objectives are not clearly described** and/or likely not attainable. Methodology is **not clearly described and/or appropriate**. The budget **does not clearly demonstrate** how the research activities to be supported are distinct from and complement those funded by other sources.
Training of HQP	Training record is **at the highest level**, with HQP contributing **to top quality research**. **Most** HQP move on to positions that require **highly desired skills**, obtained through training received. Research plans for trainees in the NSE are **appropriate and clearly defined**. HQP **success is highly likely**.	Training record is **far superior** to other applicants, with HQP contributing to high-**quality research**. **Most** HQP move on to positions that require **highly desired skills**, obtained through training received. Research plans for trainees are **appropriate and clearly defined**. HQP **success is highly likely**.	Training record is **superior** to other applicants, with HQP contributing to **quality, original research**. **Many** HQP move on to appropriate positions that require **desired skills**, obtained through training received. Research plans for trainees are **appropriate and clearly described**. HQP **success is likely**.	Training record compares **favourably** with other applicants. HQP **generally** move on to positions that require **desired skills**, obtained through training received. Research plans for trainees are **appropriate and described**. HQP **success is likely**.	Training record is acceptable but may be modest relative to other applicants. **Some** HQP move on to programs or positions that require **desired skills**, obtained through training received. Plans for trainees are **described** and **should contribute to HQP success**.	Training record is **below an acceptable level** relative to other applicants. HQP do not, in general, move on to positions that require skills obtained through training received. Plans for trainees are **not appropriate** or are **not described** with enough **information to predict the likelihood of HQP success**.

[1] The Discovery Grants Merit Indicators should be used in conjunction with the *Peer Review Manual* (Chapter 6) which outlines how reviewers arrive at a rating.

6.13. DISCOVERY GRANTS MERIT INDICATORS[1]

Cost of Research[2]	High	Normal	Low
	Majority of justified expenses represent costs **higher than the norm** for the research area.	Majority of justified expenses are within the **norm** for the research area.	Majority of justified expenses are **lower than the norm** for t research area.

2 Possible examples include: cost of training of HQP; equipment for intensive research and/or high users fees; particularly expensive or frequent consumables; travel (for collaborations, field work, access to facilities, conferences, etc.).

Rating Form - Discovery Grants Application

Applicant	Department/University	
Applicant Status:		
Title of proposal		

Evaluation criteria (See Instructions for complete details)

Excellence of researcher	**Exceptional**	**Outstanding**	**Very Strong**
	Strong	**Moderate**	**Insufficient**
• Knowledge, expertise and experience • Quality of contributions to, and impact on, the proposed and other areas of research in the NSE • Importance of contributions • (For group applications) Complementarity of expertise between members and synergy	**Rationale for rating:**		

Merit of the proposal	**Exceptional**	**Outstanding**	**Very Strong**
	Strong	**Moderate**	**Insufficient**
• Originality and innovation • Significance and expected contributions to research • Clarity and scope of objectives • Clarity and appropriateness of methodology • Feasibility • Discussion of relevant issues • Appropriateness / Justification of budget • Relationship to other sources of funds	**Rationale for rating:**		

Contributions to training of highly qualified personnel	**Exceptional**	**Outstanding**	**Very Strong**
	Strong	**Moderate**	**Insufficient**
• Quality and impact of past contributions • Appropriateness of the proposal for the training of HQP • Training in collaborative and interdisciplinary environment (if applicable)	**Rationale for rating:**		

Cost of research (relative cost of the proposed research program as compared to the norms for the field)	**Low**	**Normal**	**High**
Rationale for Cost of Research:			

Other comments (e.g., duration should be less than norm, special circumstances, quality of samples of contributions provided, Environmental impact, ethical concerns. Your Program Officer should be notified accordingly):

Comments from external referees (please also highlight any comments that would be deemed inappropriate for the members to have considered in their discussions):

Message to the applicant:

Discovery Accelerator Supplement (DAS)

- Regular DAS: Yes____ No_____
- DAS in Targeted Areas : Yes____ No_____

Rationale for DAS Recommendation:

This form is provided by NSERC as an aid to members for reviewing applications. The form contains personal information, and like all other review material, should be stored in a secure manner to prevent unauthorized access (please refer to Section 5 of the Peer Review Manual and to the text of your Confidentiality and Non-disclosure Declaration for more details on the Privacy Act.)

The rating sheet focuses on the evaluation criteria and integrates, where appropriate, external reviewer comments and any other relevant information, e.g., delays in research. Using the rating sheet will help to ensure that you take all selection criteria into account when formulating your recommendation (see Section 6 of the Peer Review Manual for details). Note that NSERC does not collect these forms, and they should be destroyed in a secure manner after the competition. (2010 version)

7. Review of Research Tools and Instruments Grant Applications

7.1 Contact Point

For eligibility, missing documents, application assignments and review process, contact the program officer.

7.2 Objectives

Research Tools and Instruments (RTI) Grants foster and enhance the discovery, innovation and training capability of university researchers in the natural sciences and engineering by supporting the purchase of research equipment and installations.

7.3 Description

RTI Grants are one-year awards that assist in buying or developing research equipment that costs more than $7,000. In exceptional cases, multiple-year requests will be accepted and the onus is on the applicant to clearly explain the rationale for these cases. While the RTI Grants Program provides the primary avenue through which to obtain support for tools and instruments costing more than $7,000, equipment of any value can be purchased using a Discovery Grant. RTI grants are divided into three categories according to the total net cost of the equipment, i.e., excluding taxes, shipping, and handling. These categories are:

- RTI – Category 1: $7,001 to $150,000;
- RTI – Category 2: $150,001 to $325,000 (Subatomic Physics only);
- RTI – Category 3: more than $325,000 (Subatomic Physics only).

NSERC will only accept applications for equipment that is purchased after the application deadline. All applications are reviewed on a competitive basis. Grantees should explore all possible avenues with the institution to cover the cost of equipment that is purchased before the application deadline (refer to the paragraph on Residual Balances in Agency Accounts under Administrative Matters in the Financial Administration section of the *Program Guide for Professors*).

7.4 RTI Applications – Category 1

NSERC will accept applications under Category 1 for equipment whose total net cost, i.e., excluding taxes, shipping and handling, is up to $250,000, provided that the applicant is able to secure funding from other sources to bring the amount requested from NSERC

to $150,000 or less. Such sources may include contributions from NSERC Discovery Grants held by the applicant or co-applicants. The use of other types of NSERC grants is permitted, provided that prior written authorization is obtained from NSERC.

NSERC will pay part or all of the applicable taxes, as well as part or all of the shipping and handling expenses, as long as the overall grant does not exceed $150,000. The applicant will be responsible for any amount in excess of $150,000.

7.4.1 Conflict of Interest

Note: The conflict of interest guidelines found in Section 6.7.1 also apply to RTI Grant applications. Best practice suggests involving only members not submitting RTI applications. The following describes options and requirements when EG members are applying:

- If EGs form a specific section to evaluate RTI applications, members with RTI applications in the current competition should not be part of the section nor should they participate in the final ranking of RTI applications.
- If EGs do not form an RTI section, but the whole EG evaluates and priority ranks applications, the final ranking of the RTI applications must be done in the absence of EG members with applications in the competition. This will allow members with applications in the competition to contribute their input on other applications, but not be involved in the final ranking.

Some EGs use a system in which all members provide an initial rating or ranking of all RTI applications (for which they are not in a conflict of interest). These ratings are used to establish a priority order for funding. During the competition meetings, the EGs may discuss only the applications that are near the estimated cutoff point corresponding to the budget available, or those with a high standard deviation as calculated from the scores received prior to competition. In such a system, members with applications in the competition must be excluded from any discussion or re-ordering of the applications. In November, when it is known which members have submitted RTI Grant applications, the program officer will propose a process to the EG Chair that conforms as closely as possible to the procedures outlined above. In designing the process, the following practices will be encouraged:

- Pre-ranking of RTI applications before the competition, with scores being sent in advance of the competition week;
- Monitoring of the deliberations by EG Chairs and/or senior NSERC staff;
- Designing spreadsheets to protect the identity of reviewers and to prevent members from learning the scores given to their own applications;
- Using past members or other experts for the adjudication of RTI applications.

7.4.2 Criteria for Evaluation

Applications are judged on the basis of the following criteria:

- **The excellence of the applicant(s)** (see Section 6.6.1 for additional factors related to this criterion):
  - Scientific or engineering calibre of the applicant and major users
  - Extent to which the applicant or the group have relevant experience and demonstrated ability to fully use the equipment
- **The merit of the proposed research program(s)** (see Section 6.6.1.2 for additional factors related to this criterion):
  - Overall quality of the research programs of proposed users
  - Recent track record
  - Potential for major advances in the discipline
- **The need and urgency for the equipment, including availability of, and access to, similar equipment:**
  - What is the impact of a delay in the acquisition of the equipment?
  - Is new equipment moving the research forward or helping to launch new research directions?
  - Will the progress of the research be slowed by lack of access to new equipment?
  - Is there a problem in accessing existing equipment (e.g., is the increased number of users slowing research progress)?
  - Are there other available facilities/services in the vicinity?
  - Is there a limited institutional infrastructure?
  - Is there a need to upgrade or replace obsolete or failed equipment?

Applicants (and co-applicants) are asked to provide information on other equipment obtained through NSERC funds and other sources within the past four years and on equipment currently applied for from other sources (e.g., Canada Foundation for Innovation). They must provide a brief description of the equipment obtained or applied for to enable the committee to evaluate the use of the equipment and its relationship with the proposal. This information should be provided in the budget justification section of Form 101.

- **The suitability of the requested item(s) for the proposed research program(s):**
  - For multi-user applications, is the proposed equipment suitable for a multi-user facility and for the desired applications?
  - Is the equipment essential to do the work, or are there other more cost effective ways of obtaining the results (e.g., send samples for analysis, use other techniques)?
  - What is the probable degree of utilization or accessibility of outside users?
  - What is the capability of applicant(s) to fully utilize the equipment?
  - How accessible will the equipment be, both in terms of location and the availability of technical support to assist in operations?

When the justification for the equipment is based to some extent on the anticipated use by, or benefit to, other sectors, the applicant should describe the support secured from these sources or demonstrated efforts made to secure it. The EG should take this information into consideration in assessing this criterion.

- **The importance of the requested item(s) for the training of highly qualified personnel** (see Section 6.6.1.3 for additional factors related to this criterion):
    - The importance of the equipment for training as well as the value of the training
    - Will this type of training be a marketable skill for students?
    - The quality and extent of training
    - The opportunity for hands-on training

Note: The necessity of the requested item(s) for the completion of student projects and theses should be addressed under the third criterion (need for access to the equipment).

7.4.3 Eligible and Ineligible Expenses

Type of Expenditure	**RTI – Category 1**
Salaries and benefits	Not eligible
Equipment or facility	Purchase or rental
Travel	Not eligible
Others (shipping costs for purchased equipment, extended warranty, brokerage and customs charges for the importation of equipment and supplies)	Eligible

The following costs are not eligible:

- Insurance costs for equipment and research vehicles;
- Costs of the construction, renovation or rental of laboratories or supporting facilities;
- Software licensing or upgrades for subsequent years.

7.4.4 Policies and Guidelines

EGs are asked to provide particularly careful and sensitive evaluation to requests for equipment from early career researchers (ECRs). In fields where any real advance requires access to sophisticated equipment that is not available on site, EGs are asked to place special weight on the "need and urgency" criterion in the case of ECRs. The "calibre and relevant experience" criterion must be assessed in the context of the pool of

relatively young researchers who do not yet have extensive research experience. An ECR should be provided with the resources to demonstrate within a reasonable period of time (for example, five years) that he/she can make significant advances in the field. However, ECRs, like all applicants, have to provide sufficient justification for the equipment requested in light of other equipment funding that they may have received from NSERC and other sources, including the Canada Foundation for Innovation.

While NSERC supports ECRs in having an appropriate opportunity to build a strong research program, responsibility for this does not rest solely with NSERC. The university is expected to assist in launching a young researcher's program. Award quotas by department or university are not permitted. The EG cannot establish policies whereby, for example, RTI applications from a given applicant could only be recommended every two years.

RTI awards should normally be for the full cost of the recommended items (including tax, transportation and eligible installation costs). EGs may recommend partial funding, but the amount recommended must be sufficient to allow for the purchase of a functional unit. The EG must provide staff with details of the partial award, including a listing of all components to be funded. Program officers will prepare written comments to specify which components of the equipment are being funded.

NSERC asks EGs to provide a ranked RTI list in the event that the budget situation changes after the competition. It is important that the final ranked RTI list, both within or exceeding the expected budget, truly reflect the order in which an EG wants RTI applications to be funded. Last-minute revisions to the RTI budget may result in more or fewer awards being made, and NSERC staff rely on the EG rankings to make these adjustments.

7.4.5 Deliverables

Reviewers typically use a spreadsheet to submit ratings (for all applications assigned to them) to the program officer in advance of the competition session. These ratings are tabulated and applications sorted by priority. The prioritized list is distributed at the competition session, and a subset of the applications is discussed in depth at that time. These are applications that are typically near the cutoff for which ratings from different reviewers differ significantly or for which a member questions the priority assigned to the application. The exact process may take different forms, e.g., straight ranking of all applications, a rating on a 5- or 10-point scale either with a flat distribution (equal numbers of 1, 2, 3, etc.) or a normal distribution. The section chair or program officer will brief members on the EG's particular procedures.

7.4.6 Use of Rating Form

Using the rating forms provided by NSERC will help to ensure that all criteria are taken into account when formulating recommendations for RTI applications. However, its use is not mandatory.

7.5 RTI Applications – Categories 2 and 3

The review of RTI grant applications, Categories 2 and 3, **only** applies to Subatomic Physics. This review is carried out in agreement with the internal procedures of the Subatomic Physics Evaluation Section. For additional details related to the internal procedures of the Subatomic Physics Evaluation Section, please contact the program officer responsible for the section.

7.5.1 Conflict of Interest

The conflict of interest guidelines found in Sections 6.7.1 and 7.4.1. also apply to RTI applications in categories 2 and 3. The following text describes the conflict of interest guidelines used by the SAP Evaluation Section.

Each member must notify, as early as possible, to NSERC any real, apparent or potential conflict of interest. There is real, potential or apparent conflict of interest:

- when a member is the applicant, co-applicant or co-signer;
- when a member is, or was in the last six years, from the same university, organization or department, or belongs, or belonged in the last six years, to the same research unit as the applicant(s);
- when a member is, or was in the last six years, part of the project's collaboration in his/her own country;
- when there is an administrative or family link between the member and the applicant (e.g., head of the department, dean of the faculty);
- when the member is an industrial or government representative who is, or was in the last six years, directly involved in collaborative activities with the applicant;
- when the member is a former research supervisor or graduate student of the applicant(s), or has collaborated or published with the applicant(s) within the past six years;
- when a member is, or was in the last six years, a member of any advisory body (such as a committee) to a resource applying for support or a facility that hosts the proposed research;
- when the member is uncomfortable with reviewing the applicant's proposal due to previous conflicts or any other reason;
- when NSERC staff have reason to believe that a specific member should not be involved in the review.

The above guidelines do not necessarily respond to all possible situations, and NSERC relies on the active participation of the section members in identifying any situation that

could be a real, potential, or apparent conflict of interest. The final decision on conflicts of interest rests with NSERC.

Note: For proposals involving at least four universities, a section member from the same institution as the principal investigator, or one or several of the co-applicants, is allowed to participate to the discussions and vote as long as he/she is not involved in the same project/collaboration.

7.5.2 Criteria for Evaluation

In addition to the criteria for evaluation described in section 7.4.2, applications are judged on the basis of the following criteria:

Organizational structure, accessibility and synergy:
The applicant(s) must clearly demonstrate a clearly defined organizational structure to ensure that the equipment can be operated and maintained efficiently and effectively, as well as providing ready access for other users. Examples of elements to be addressed include:

- provisions for the maintenance and upgrading of equipment
- operation of the equipment
- efficiency, effectiveness and accessibility for other users
- appropriateness of the proposed plan and budget for maintenance and upgrading
- suitability of the director's and users' committee
- value and capability of each piece of equipment

In addition, the synergy of the proposed equipment or installation with existing ones should be considered. Synergy, in this case, is considered to be the extent to which a grouping of equipment and staff enhances the value and capability of each piece of equipment and enables researchers to obtain results or carry out studies that would otherwise be very difficult or impossible.

7.5.3 Eligible and Ineligible Expenses

Type of Expenditure	**RTI – Categories 2 and 3**
Salaries and benefits	Salaries and training costs of technical support personnel for the initial phase-in period of operations (up to two years)
Equipment or facility	Purchase or rental
Travel	Travel costs to visit manufacturers to select major equipment purchases

Type of Expenditure	RTI – Categories 2 and 3
Others (shipping costs for purchased equipment, extended warranty, brokerage and customs charges for the importation of equipment and supplies)	Eligible

The following costs are not eligible:

- Insurance costs for equipment and research vehicles;
- Costs of the construction, renovation or rental of laboratories or supporting facilities;
- Software licensing or upgrades for subsequent years.

7.5.4 Site Visits

In the case of RTI – Category 2 and 3 applications, the SAP Evaluation Section may receive input from an expert *ad hoc* committee that would perform an on-site review.

After the review, each committee submits a report to NSERC. Each report is provided to the section members (except those in conflict), as well as to the applicants (without the funding recommendations), prior to the competition.

While these ad hoc committees provide expert assessments, the SAP Evaluation Section makes the conclusive recommendation to NSERC on any application.

For additional information related to Site Visits or any other SAP specific aspect of the review process, please contact the program officer responsible for the section.

Rating Form
Research Tools and Instruments Grant Application

Applicant	**Department/University**	First-time Applicant ☐
Title of Proposal	Amount Requested	
	Number of Users	

EVALUATION CRITERIA (See Section 7 of Peer Review Manual)	
	Provide comments on each criteria
Excellence and experience of researcher(s)	
Caliber of applicant/users	
Relevant experience to use the equipment	
Demonstrated ability to fully use the equipment	
Merit of programs to be supported	
Quality of research program(s) of proposed users	
Recent track record	
Potential for major advances in the discipline	
Need and urgency	
Impact of delay in the acquisition of the equipment	
Impact of equipment on program(s) and areas of research (e.g. launch of new directions; draw backs...)	
Accessibility of equipment to users	
Need for dedicated equipment	
Availability of similar equipment in the vicinity	
Institutional infrastructure limitations	
Need to upgrade or replace obsolete or failed equipment	
Suitability for proposed research	
Probability of utilization or accessibility of outside users	
Capability of applicant(s) to utilize equipment	
Accessibility of equipment (location & availability of technical support)	
Impact on HQP training	
Importance of the equipment for training	
Quality and extent of training	
Training received could be a marketable skill for HQP	
Opportunities for hands-on training	
Other comments (e.g., special circumstances):	

Overall Impression/Priority:	**Rating:**

Recommendation (explain and describe item(s) if a partial award is recommended): $

Peer Review Manual - Section 8

Major Resources Support Grant Applications

As part of the Government of Canada's efforts to return to balanced budgets, the NSERC Major Resources Support (MRS) Program will no longer be accepting new applications at this time. Commitments for existing instalments will be honoured; however there will be a moratorium on the MRS Program. This does not apply to Subatomic Physics applications

August 2012

8. Review of Major Resources Support Grant Applications

8.1 Contact Points

- For missing documents: Program assistant
- For any other matter: Program officer

8.2 Objective

The objective of the Major Resources Support (MRS) program is to facilitate the effective access of Canadian academic researchers to major and unique national or international (based in Canada) experimental or thematic research resources by financially assisting these resources to remain in a state of readiness for researchers to use. MRS grants are not intended to support resources that are standard in a discipline or commonly available in Canadian universities. The national scope of a resource is linked to its uniqueness in Canada **and** the requirement for its significant use by a sufficiently large number of users (not collaborators) from across the country, beyond any individual institution or region. The international scope requires a resource to first serve a national community of users, in addition to a significant use by a sufficiently large number of users from outside Canada.

The MRS program also aims to facilitate access by Canadian academic researchers, who come together as **national** consortia, to **major** international resources located outside Canada, the equivalent of which is not available in Canada. This support excludes any direct financial support towards the operating and maintenance costs of such resources.

Research resources are defined as experimental research facilities or thematic research organizations such as institutes. An institute is defined as a research resource that promotes and triggers national, and possibly international, interactions within a given research community and provides a place where researchers meet, collaborate and exchange ideas. Institutes are resources that provide an environment that serves to accelerate research within disciplines, as well as to promote links between different disciplines, thus fostering interdisciplinary research.

8.3 Description

MRS grants assist major and unique **national** or **international** experimental and thematic research resources located in Canada in covering their operating and maintenance costs. Supported resources are those that cannot fully cover such costs using other sources of funding or through user fees, or those where user fees cannot be leveraged. The grants assist resources that are significant in size, value or importance, and that are not

customary in a discipline or commonly available in Canadian universities. Supported resources must be used by researchers from several institutions (including universities, government laboratories, or companies) across Canada.

Major resources supported by this program may include:

- unique specialized experimental facilities or field research stations;
- research institutes that promote and trigger interactions within the constituents of relevant communities;
- a core of highly skilled technical or professional research support staff essential to the research activities of a group;
- a large specialized items of research equipment; or
- a collection of specialized samples or objects, as defined in the Framework for Researchers Working with University-Based Collections.

MRS grants also assist Canadian academic researchers who come together as **national** user consortia to access major resources located abroad and whose equivalent is **not available** in Canada. Such support excludes any direct contribution towards the operating and maintenance costs of foreign resources. The support is not given to individual researchers, but rather to the user consortia, which must be composed of researchers from several institutions (including universities, government laboratories, or companies) across Canada.

8.4 Conflict of Interest

The conflict of interest guidelines found in Section 6.7.1 of this manual apply to the review of MRS grant applications. In addition, a member is considered in a situation of conflict of interest when the member is, or was in the last six years, a member of any advisory body (such as a committee) to a resource applying for support.

For MRS grant applications involving **at least four** universities, a Committee member from the same institution as the applicant, or one or several of the co-applicants, is allowed to participate in the discussions and vote as long as the member is not affiliated to the same department.

NSERC's guidelines on conflicts of interest will be strictly applied throughout the various steps of the review process.

8.5 Criteria for Evaluation

Any grant application to the MRS program must be assessed on the basis of the eight selection criteria listed below. For each criterion, factors that must be considered are

given. To be recommended for MRS funding, a resource must meet **all eight** criteria. The onus is on the applicants to thoroughly address each criterion in their applications and provide detailed information to the MRS Grant Selection Committee.

- **Uniqueness of the resource**
    - The research resource is **not standard** in a discipline and is **not commonly available** in Canadian universities.
    - The **national** or **international** nature of the resource. The national scope of a resource is linked to its uniqueness in Canada **and** the requirement for its significant use by a sufficiently large number of users (not collaborators) from across the country, beyond any individual institution or region. The international scope requires a resource to first serve a national community of users, in addition to a significant use by a sufficiently large number of users from outside Canada. The onus is on the applicant to demonstrate to the Committee that the resource is needed and **significantly** used by a sufficiently large number of users (academic and non-academic) from outside the host institution and beyond a region.
    - The uniqueness of the resource compared to **any** other Canadian resources that may be providing similar services. Does the resource complement or duplicate part or all of any other resource? Where applicable, is any duplication necessary and justified? In case of any duplication, could the involved resources have coordinated or combined their activities in order to become a unique national resource?
    - **Significant use** of the resource by a sufficiently large number of users (academic and non-academic) **from outside the host institution and beyond a region**.

- **Use of the resource by the research community**
    - Past (if applicable), current and projected levels of use of the resource.
    - Accessibility of the resource to, and actual use by, researchers (academic and non-academic users) beyond the host institution and a region.
    - Potential for collaboration with complementary Canadian or, if applicable, international resources.
    - Extent to which the resource can accommodate the specialized needs of the users.
    - Demonstrated outreach to the potential Canadian or, if applicable, international academic and non-academic user communities.

- **Need for access to the resource for the research programs**
    - Impact of the resource on the advancement of the research programs of current and projected users and, when applicable, on the dissemination and use of the generated knowledge in the supported area(s) of research.

- Consequence of the loss of access to the resource on the users' research programs.

- **Merit of the research programs that rely on access to the resource and excellence of the user community**
  - In the case of experimental resources: quality, significance and pertinence of ongoing research programs of the users.
  - In the case of thematic resources: quality, pertinence and impact of the past (if applicable), current and planned scientific activities, and significance of the research themes to the related communities.
  - This factor, as the previous one, can be assessed by answering questions found in Section 6.6.1.2, Merit of the Proposal.
  - Excellence of the users and, in the case of thematic resources, excellence of activity organizers and users, and their level of commitment to the activities within the resource.
  - This factor can be assessed in a similar way to the Scientific or Engineering Excellence of the Researcher(s) in Section 6.6.1.1. Co-applicants are major users of the resource. The applicant and every co-applicant are allowed to include one page each in the application to describe their individual research programs, their use of the resource, the importance of the latter to their research programs and to the training of their highly qualified personnel, and to list relevant contributions.
  - Scientific (knowledge and technology) return on the investment in the resource.

- **Demonstrated need for support through an MRS grant**
  - Demonstrated need for, and effectiveness of, support through an MRS grant as opposed to other NSERC grants and contributions from other sources.
  - Nature and extent of the commitment and support from universities and other organizations.
  - Justification of the requested funds from NSERC.
  - Proposed sharing of costs among NSERC, universities and other sources, including user fees (if applicable).
  - Rationale for the proposed user fees (if applicable).

- **Management of the resource**
  - Effectiveness of the management structure.
  - Administration and allocation of access to the resource to different users (internal and external, from universities, government or industry).

- Is there a process to ensure accessibility of the resource to users from outside the host institution? Is the resource active in reaching out to potential user communities in order to increase their awareness of the activities and opportunities offered by the resource? Are outside users part of the resource's governing body or user committees?
- Plan and budget for maintenance and operation of the resource.
- Plan of the resource to keep abreast of scientific and technical advances, as well as to sustain well coordinated and leading edge research activities.

- **Contribution of the resource to the training of highly qualified personnel**
  - Importance of the resource for training, including unique training opportunities offered by the resource.
  - Extent and excellence of training.
  - Opportunity for hands-on training.

  Refer to the Section 6.6.1.3, Contribution to Training of Highly Qualified Personnel, in order to assess this criterion.

  Note that the use of, or the need for, the resource, with respect to the completion of student projects and theses should be addressed under the third criterion above, "Need for access to the resource for the research programs."

- **Synergy**
  - Defined as the extent to which a grouping of equipment, staff or participants enhances the value and capability of a resource and enables researchers to obtain results or carry out studies that would otherwise be very difficult or impossible.

8.6 Eligible Expenses

Support of Resources Located in Canada
MRS grants provide funding to assist in covering the following costs:

- Salaries of technical and professional research support staff employed to operate and maintain the resource, as well as to provide assistance to users;
- Operating and maintenance of the resource;
- Materials, supplies and minor equipment essential to the operation and maintenance of the resource;
- Travel expenses for resource support staff of the facility to attend conferences as part of the resource's plan to keep abreast of scientific and technical advances;
- Dissemination costs, as part of the resource's outreach activities towards relevant user communities; and

- Operation of scientific review panels and governing bodies.

Furthermore, in the case of thematic resources, MRS grants also provide funding to assist in paying the following costs, which should be listed as part of the operating costs:

- Remuneration of graduate students and postdoctoral fellows involved in a context of thematic or collaborative program;
- Visitor expenses, including travel and local support; and
- Honoraria for distinguished speakers.

In the case of experimental resources, the costs of running the facilities should be split into two major components: non-recoverable and recoverable. **Only non-recoverable costs are eligible** for MRS funding.

- Non-recoverable costs are those expenses necessary to keep the experimental resource in a state of readiness for researchers to use, and to increase the awareness of the potential user communities of the activities and opportunities offered by the resource. They are independent of the number of researchers actually using the resource, and are not associated with specific research projects.
- Recoverable costs comprise expenses directly incurred when researchers and their highly qualified personnel use the experimental resource. Examples of such costs are those for consumables that are used for specific projects, sample preparation and analysis in the case of analytical facilities, and food, fuel and staff salaries for specific projects in the case of field stations. Recoverable costs should be charged as user fees against the users' Discovery Grants or other funding sources, and they should **not be included** in the amount requested from the MRS program. Regarding user fees, NSERC recommends that holders of MRS grants adhere to the guidelines given in Table I. In some cases, a moderate differential between internal and external academic users may be accepted, provided that a case is made to justify it and to demonstrate that its impact on the accessibility to the resource would be minimal.

Type of User	Appropriate Fee
Academic researchers (internal **and** external) and their students	Lowest rate
Non-academic users from organizations contributing to the resource	Intermediate rate
Non-academic users from non-participating organizations	Highest rate

Table I – Guidelines on user fees for experimental resources

Due to the nature and purpose of **thematic resources**, costs directly incurred when researchers and their highly qualified personnel use such resources are **eligible** for MRS funding. This is in addition to the expenses necessary to keep the resource in a state of readiness for researchers to use, and to increase the awareness of the potential user communities of the activities and opportunities offered by the resource.

Support of Access to Resources Located Outside Canada

MRS grants assist **national** user groups in accessing major resources located abroad, whose equivalent is not available in Canada. Such support **excludes** any direct contribution towards the operating and maintenance costs of such resources. The following costs are eligible for MRS funding:

- Membership or access/user fees;
- Minor equipment needed to accommodate the specific needs of the Canadian users;
- Travel related to the use of the foreign resource, i.e., field work; and
- Salaries of **Canadian** technical and professional research support staff employed to assist in the use of the resource by the Canadian users.

8.7 Ineligible Expenses

MRS grants **cannot** be used to pay for any indirect costs of research or expenses that are central or departmental institutional costs. Examples of such indirect costs include, but are not limited to, those for the maintenance and renovation of research spaces and buildings, leasing costs of spaces and equipment, utilities, general technical support to laboratories, security and occupational safety, or insurance. Other ineligible costs could be found in the Use of Grant Funds section of the NSERC *Program Guide for Professors*. Furthermore, MRS grants **cannot** be used to pay for the establishment, construction or infrastructure expansion (e.g., capital enhancement) of a resource.

8.8 Application Procedures

The MRS competition is held annually. The first step in applying to the MRS program is to submit a Letter of Intent to Apply for a Major Resources Support Grant (Form 181). The Letters of Intent undergo a review process to ensure that the resources meet the program's objectives and key guidelines. Only resources whose Letters of Intent are accepted will be invited to put forward grant applications.

The deadline for submitting a Letter of Intent is **May 1**. NSERC communicates with all applicants by the end of July to inform them about the status of their Letter of Intent and to invite the successful applicants to put forward grant applications. The deadline for submitting a grant application is **October 1**.

Case of Subatomic Physics Resources

In the cases of resources that will be reviewed by the Subatomic Physics Section, Form 181 will not be used for screening purposes. It will be used solely to determine the most appropriate review mechanism for each grant application. **All subatomic physics applications will be accepted**, and NSERC will not communicate with the applicants to invite them to put forward grant applications. The deadline for submitting a Letter of Intent for subatomic physics resources is **August 1**.

8.9 Review Procedures

Letter of Intent (excluding subatomic physics resources)

An NSERC internal committee, in consultation with one MRS committee member, will review the Letters of Intent. In addition to the general objectives of the program, the only selection criterion to be assessed in this review will be the major character and uniqueness of the resource. This assessment will be made on the basis of the following factors:

- The research resource is **not standard** in a discipline and is **not commonly available** in Canadian universities;
- The **national** or **international** nature of the resource;
- The uniqueness of the resource compared to **any** other Canadian resources that may be providing similar services; and
- **Significant use** of the resource by a sufficiently large number of users (academic and non-academic) **from outside the host institution and beyond a region**.

Again, the national scope of a resource is linked to its uniqueness in Canada **and** the requirement for its significant use by a sufficiently large number of users (not collaborators) from across the country, beyond any individual institution or region. The international scope requires a resource to first serve a national community of users, in addition to a significant use by a sufficiently large number of users from outside Canada.

The review of the Letters of Intent by NSERC will be done in consultation with members of the MRS Selection Committee or external reviewers. External reviewers will be former members of the Major Facilities Access (MFA)[1] or MRS Grant Selection Committee, or MFA/MRS ad hoc review committees. Reviewers will receive the Letters of Intent that are closely related to their discipline, and will be asked to make written recommendations to NSERC on the eligibility of the reviewed resources on the sole basis of the major character and uniqueness of the resource, according to the four factors listed above. The reviewers' extensive and up-to-date knowledge of the disciplines will allow them to be well-informed critics of these factors.

[1] The MFA program was replaced by the MRS program in the spring of 2006.

The final decision on any Letter of Intent will rest with NSERC. Applicants whose Letters of Intent are accepted will be invited to put forward full grant applications.

Grant Applications (excluding subatomic physics resources)

Applications to the MRS program are reviewed by a multidisciplinary Grant Selection Committee. This Committee is composed of distinguished members who have extensive expertise in, and broad practical knowledge of, experimental and thematic resources in the various disciplines that NSERC serves.

For each application, expert input will be sought from individual referees with relevant expertise. Alternatively, a discipline-based ad hoc committee, comprised of former or current members of NSERC's discipline-based Discovery Grants review committees and possibly other distinguished scientists, may be used to review all the applications in a certain discipline. The referees, or ad hoc committees, will be asked to provide NSERC with a written report addressing the eight selection criteria. No explicit funding recommendation (amount) will be requested in such a report.

Furthermore, in cases where the selection committee deems additional information is required for assessment, a meeting with the applicant may be requested.

The MRS Grant Selection Committee makes the conclusive recommendation to NSERC on any application. The eligibility of applications that have been submitted further to invitation following the Letter of Intent screening process will also be assessed at the application stage.

Grant Applications (subatomic physics resources)

In the case of subatomic physics resources, grant applications are only reviewed by the Subatomic Physics Section. No external input is usually sought. The Section may request expert input from individual referees in other disciplines, if necessary. Furthermore, the Subatomic Physics Section may also receive input from an expert ad hoc committee that would perform an on-site evaluation and review of the resource, in agreement with the Section's internal procedures. NSERC reserves the right to perform an on-site evaluation and review of any subatomic physics resource. Moreover, according to the Subatomic Physics Section's internal procedures, resources may be invited to make oral presentations during the Large Project Day held every year by this Section.

The Subatomic Physics Section makes the conclusive recommendation to NSERC on any subatomic physics grant application to the MRS program.

8.10 Duration and Conditions

MRS grants can be awarded for up to three years. For a given proposal, the MRS Grant Selection Committee can recommend any duration it considers appropriate on the basis of the evaluation of the application.

It is important to remember that when a one-year award is recommended, the applicant will only have about five months to address any problems noted by the Committee, since comments are sent in April and applications are due by October 1.

For grants whose average is of $500,000 per year or higher, the payment of the second and any of the subsequent yearly installments (up to year 3) is conditional on the submission of an annual activity report to NSERC. The deadline for the submission of such a report is February 1.

8.11 Guidelines for Reduced Funding Recommendations

The MRS Grant Selection Committee may reduce or discontinue funding of a resource for the following reasons:

- budgetary constraints;
- an application does not contain sufficient information, in the opinion of the Committee, to allow adequate assessment of each selection criterion; or
- the resource no longer satisfies the selection criteria.

In any of the above situations, NSERC will consider providing ramp-down funding, subject to availability of funds. The Committee is asked to carefully review the resource's budget and consider the impact of reduced or discontinued funding on the resource's current commitments. Written comments **must** accompany all recommendations for reduction or termination.

The onus is on the applicant to provide sufficient details to allow the MRS Grant Selection Committee to recommend the appropriate level of funding. In situations where insufficient details are provided, either as part of an Application for a Grant (Form 101) or a Personal Data Form (Form 100), the Committee can recommend a reduced duration, reduced funding, or no funding.

8.12 Deliverables

The MRS Grant Selection Committee members who participate in the assessment of an application will be asked to rate it and make a funding recommendation (amount and duration). Committee members should review the applications assigned to them according to the selection criteria listed above. Reviews, formal consultations or site visit

reports will be supplied to the Committee members as soon as they are received by NSERC. These reviews, consultations and reports help provide deeper overall assessments of the applications. The members of the MRS Grant Selection Committee should consider the reviews, consultations and reports as key tools in the evaluation process. The members must, however, **ultimately base their recommendations on their own assessments**. The reviews, consultations and reports contribute to these assessments, but they must not be used on their own to either accept or reject a proposal.

Note: The MRS Grant Selection Committee could have access to the previous comments (Message to Applicant) sent to an applicant at the time of the last review of the applicant's resource, if applicable. These comments should be reviewed **only at the end** of the deliberations on the application to ensure that the current Committee is making a recommendation that takes into account requests or obligations previously communicated to the applicant. When making its recommendation, the Committee may take into account issues raised previously that have or have not been adequately addressed by the applicant in a new application.

8.13 Use of the Rating Form

An excellent aid for reviewing MRS applications is the Rating Form – Major Resources Support Grant Application that is provided by NSERC. This form is used by the discipline-based review committees or referees. The form focuses on the evaluation criteria and integrates all relevant information. Using this form helps to ensure that all criteria are taken into account when formulating a recommendation. Once completed, the form should be treated as containing protected information.

8.14 Preparing Comments to Applicants

Comments from the MRS Grant Selection Committee are required for all applicants. The internal reviewers of the Committee must prepare such comments for the applications they were assigned. The comments must be circulated within the Committee and be carefully reviewed to ensure that they represent the Committee's discussion and consensus. The final version of the comments must reflect the opinion of the entire Committee. Constructive comments to applicants are of vital importance to enable them to improve future applications. The Committee is encouraged to provide constructive, specific, and helpful comments to applicants. Both **strengths and weaknesses** are appropriate for comment. The comments must be in accordance with NSERC guidelines and appropriate for transmission to the applicant. If at all possible, the Committee should write the comments in the applicant's preferred language.

8.15 Rating Form – Major Resources Support Grant Application

Rating Form – Major Resources Support Grant Application

Applicant:

University:

Application no.:

Name of reviewing ad hoc committee or referee:

Title:

Requested amounts:

Degree of relevance to the reviewing committee or referee:

☐ **High** ☐ **Medium** ☐ **Low**

Total number of applications with a high or medium degree of relevance for the reviewing committee (not applicable to referees):

Rank/priority of this application (1st, 2nd, 3rd, etc.) relative to the reviewed applications with a high or medium degree of relevance (not applicable to referees):

Overall merit rating of this application (A^+, A, A-, B^+, etc.)

Must be funded	☐ **A+**	☐ **A**	☐ **A-**
Worth funding	☐ **B+**	☐ **B**	☐ **B-**
Do not fund		☐ **C**	

Who is providing this report:

☐ **Ad hoc discipline-based committee**

☐ **Referee**

In order to assess whether the request for funds is **justified**, the following criteria must be addressed. Use a maximum of three pages for **detailed** comments and address **all criteria** in the same order as they are listed below. No explicit funding recommendation (amount) is requested.

1. Comment on the **uniqueness of the resource** as demonstrated by (a) the fact that the research resource is **not standard** in a discipline and **not commonly available** in Canadian universities; (b) the **national** or **international** nature of the resource; (c) its uniqueness compared to **any** other Canadian resources that may be providing similar services; (d) the level of use of the resource by users (academic and non-academic) from **outside the host institution and beyond a region**.

2. Comment on the **use of the resource by the research community** by taking into account (a) past (if applicable), current and projected level of use of the resource; (b) the accessibility of the resource to, and actual use by, researchers (academic and non-academic users) beyond the host institution and a region; (c) the potential for collaboration with complementary Canadian or, if applicable, international resources, (d) the extent to which the resource can accommodate the specialized needs of the users; (e) the demonstrated outreach to the potential Canadian or, if applicable, international academic and non-academic user communities.

3. Comment on the **need for access to the resource for the research programs** and address (a) the impact of the resource on the advancement of the research programs of current and projected users and, when applicable, on the dissemination and use of the generated knowledge in the supported area(s) of research; (b) the consequence of the loss of access to the resource on the users' research programs.

4. Comment on the **merit of the research programs that rely on access to the resource and excellence of the user community** as demonstrated by (a) the quality, significance and pertinence of ongoing research programs of the users, in the case of experimental resources; (b) the quality, pertinence and impact of the past (if applicable), current and planned scientific activities, and significance of the research themes to the related communities, in the case of thematic resources; (c) the excellence of the users and, in the case of thematic resources, the excellence of activity organizers and users, and their level of commitment to the activities within the resource; (d) the scientific (knowledge and technology) return on the investment in the resource.

5. Comment on the **demonstrated need for support through an MRS grant** and address (a) demonstrated need for, and effectiveness of, support through an MRS grant as opposed to other NSERC grants and contributions from other sources; (b) the nature and extent of the commitment and support from universities and other organizations; (c) the justification of the requested funds from NSERC; (d) the proposed sharing of costs among NSERC, universities and other sources, including user fees (if applicable); (e) the rationale for the proposed user fees (if applicable).

6. Comment on the **management of the resource** and discuss (a) the effectiveness of the management structure; (b) the administration and allocation of access to the resource to different users (internal and external, from universities, government or industry); (c) the plan and budget for maintenance and operation of the resource; (d) the plan of the resource to keep abreast of scientific and technical advances, as well as to sustain well coordinated and leading-edge research activities.

7. Comment on the **contribution of the resource to the training of highly qualified personnel** and discuss (a) the importance of the resource for training, including unique training opportunities offered by the resource; (b) the extent and excellence of training; (c) the opportunity for hands-on training.

8. Comment on the **Synergy** that characterizes the resource. Synergy, in this case, is considered to be the extent to which a grouping of equipment, staff, or participants enhances the value and capability of a resource and enables researchers to obtain results or carry out studies that would otherwise be very difficult or impossible.

9. Other comments

9. Activities for February

9.1 Logistics for Competition Session

9.1.1 Agenda

Program officers, in consultation with the section chairs, will prepare an agenda for the competition session and forward it to members prior to the meetings.

9.1.2 Physical Arrangements

Hotel and Travel

The competition sessions are held for a number of EGs on NSERC's premises, Constitution Square, Tower II, 350 Albert Street, Ottawa, and for others at a nearby facility. Out-of-town members usually stay at a hotel in downtown Ottawa close to the NSERC offices.

Information regarding travel and physical arrangements for the February meetings will be sent to members in December. At such time, members will be required to confirm their hotel and travel arrangements through Carlson Wagonlit by Global Travel Centre, NSERC's travel agent (see Appendix 4). **Members not requiring travel arrangements must still contact NSERC's travel agent to confirm their hotel reservations.**

9.2 Roles and Responsibilities for EG Members and NSERC Staff

EG Section Chair

The section chair provides leadership to ensure the orderly and complete evaluation of applications and the transmission of accurate recommendations to NSERC. The section chair ensures that all important aspects of proposals are considered and that a consensus is reached for all applications.

The section chair leads the EG section's efforts to maintain the high quality of the peer review process. This includes advance briefing of EG members and ensuring the consistency and equity of approach of the EG in the February meetings.

The section chair contributes to discussions on policy issues, new emerging areas of research, particular discipline problem areas, etc. This includes input on the EG's annual report.

The section chair coordinates the preparation of Messages to Applicants during the competition session to ensure that they reflect the full EG consensus and not the views of a single member.

EG Members

See also Section 1.2 of this manual. Specific responsibilities during the February meetings include:

- presenting in-depth evaluations for the applications assigned to them as 1st and 2nd reviewer;
- reading, being ready to discuss, and voting on all assigned applications;
- preparing the Messages to Applicants (Form 141) that reflect the group consensus;
- adhering to NSERC's guidelines and regulations on the review of applications, conflict of interest, communication with applicants and confidentiality.

Members may also participate as part of a section to evaluate RTI, MRS applications, etc. This will be confirmed by the program officer.

Program Officers

- The program officer advises on NSERC policies, guidelines and procedures, and helps ensure consistency in evaluation of all applications assigned to the EG;
- Ensures that recommendations are accurately recorded and that Messages to Applicants that reflect the consensus of the EG are prepared where they are required;
- Ensures that recommended awards conform with the budget allocated to the EG and with NSERC guidelines;
- Brings any problem areas to the attention of the section chair or the group chair, or to the team leader or director;
- Ensures consistency of approach (e.g., use of referees, evaluation of RTI applications, funding policy) from year to year;
- Assists the EG in the use of the reference material provided by NSERC;
- Assists the EG in identifying candidates for membership.

Program officers are not EG members and do not vote on applications.

Group Chairs

Group chairs are members of the Committee on Grants and Scholarships (COGS). In this capacity, they act in the best interest of all areas of science and engineering, while bringing to the discussion their particular knowledge of the disciplines under their purview.

One of the principal roles of group chairs during the competition sessions is to monitor the quality of review in the EG under their responsibility and to interact with them as necessary. This includes acting as a constructive critic, advising EGs on NSERC policies and procedures, and representing their opinions and concerns to COGS and to NSERC. While the group chair role is associated with disciplines close to their own field of expertise, they are encouraged to sit in on EGs in other disciplines to familiarize themselves with those discipline-specific issues or dynamics.

Group chairs are not members of the EGs under their purview and do not vote. They may attend only part of the competition sessions and normally attend policy meetings of the relevant EGs. More specifically group chairs will:

- Chair and participate on the EG executive committee
- monitor the effect of the budgetary situation on new applicant recommendations, success rates and grant values;
- advise NSERC on special requests from EGs;
- attend the discussion of specific cases, as identified by NSERC staff;
- when possible, attend the discussion of applications from EG members (the Conflict of Interest Guidelines require the presence of a group chair or delegate);
- observe the mode of operation of the EGs, peer review process, group dynamics and other issues;
- assist with the preparation of Messages to Applicants, as needed;
- identify any policy issues that may require discussion at COGS or action by staff;
- participate in the discussion of the membership for the following year. Group chairs help NSERC to identify next year's section chair(s) for EGs, in consultation with the NSERC staff, the current section chair(s) and senior EG members;
- review the statistics on and trends in awards made upon recommendation of the EGs and the list of any other awards approved by executive action;
- periodically review the jurisdiction of EGs and recommend changes as appropriate.

The work of a group chair, like that of an NSERC staff member, is a delicate balance of advocate, advisor and critic. The EGs have full responsibility for the evaluation of grant and scholarship applications assigned to them according to policy guidelines established by NSERC. Only in situations involving a violation of guidelines or "unfair" evaluation is a recommendation overturned. The group chairs and NSERC staff work together to monitor the quality of review and to develop policy.

Directors

The directors (Research Grants) work with group chairs to monitor the quality of peer review and the effectiveness of programs. They also identify and monitor policy issues and provide advice to group chairs and program officers on the interpretation of policies and rules.

When possible, directors attend the policy meetings of the EGs under their responsibility.

Team Leaders

The team leaders are responsible for discipline groupings. They observe the deliberations of all EGs under their responsibility, maintain relationships with the EGs, provide advice to program officers and EGs on policy, specific cases and procedural issues and assist with problems. They attend the policy meetings of the EGs and brief members on new developments at NSERC and identify new section chairs for EGs.

Program Assistants

Program assistants provide support to program officers in all aspects of the competition, e.g., by preparing Messages to Applicants and other documents as needed, by assisting with requests for joint reviews, and by replacing the program officers for short periods of time, as required.

Program Operations Unit Staff

Secretariat Offices will operate throughout the competition. The Secretariat is the first point of contact for questions/problems regarding logistics and physical arrangements (meeting rooms, food, security and keys, light, photocopying, faxes, changes in travel arrangements, messages, etc.).

9.3 Procedures for Presenting Applications

Before discussion of each application, the section chair will ask if members wish to declare a conflict (see Sections, 6.7.1 and 7.4). Refer to EG procedures for specific details on presenting applications. An important consideration for making the conference model work is adhering to the EG's schedule. Section chairs and/or program officers must ensure that discussions proceed at a rate that will allow the EG to get through its work within the time available, and EG members should be aware of this while presenting and preparing their presentations ahead of time

9.4 Message to Applicant (Form 141)

Following the discussion of each Discovery Grant application, the program officer will indicate if a Message to Applicant is needed and will designate a member to prepare it.

While reviewers may have drafted comments prior to the February EG discussion, the final version must reflect the consensus of the EG. EGs are encouraged to finalize as many comments as possible during the competition session. The Messages to Applicants are collected regularly from the EG, and returned for verification. Members preparing comments should ensure that they are drafted before the end of each day and should

verify them with the other members for accuracy and completeness before submitting them to the program officer.

9.5 Policy Meeting

EGs may hold a brief policy meeting following the completion of its deliberations. The policy meeting generally includes a discussion of the quality of applications, the number and quality of new applicants, selectivity, problem cases, comments on NSERC's administrative services, policies, forms, literature, etc.

In addition, feedback from the EG is sought on policy matters currently under review at NSERC.

9.6 Membership Recommendations

The process of identifying new EG members to replace those whose term ends in June continues throughout the fall and winter. To facilitate and accelerate the process of completing the EG's membership for the following year, all information about the background, stature and experience of nominees should be forwarded to the program officer. References on the nominees' suitability to participate in the peer review process and to work in an EG setting should also be provided.

The policy meetings will include a discussion of the EG membership. Ideally, all potential members should have been identified at that time so that the EG as a whole can discuss the suggestions and establish priorities.

9.7 Confidentiality of EG Funding Recommendations

EG funding recommendations are made by the executive committee and are subject to approval by NSERC and may be changed for reasons of budget, administrative error or lack of full adherence to NSERC policies. NSERC communicates the results of the decisions on grants in late March following final approval. Master lists are released to each university shortly before, or concurrent with, individual letters of notification. Funding decisions are also posted on the NSERC Web site.

Details of the EG discussion on a specific applicant are confidential and must **not** be divulged to others. Release of information to applicants **must** be done by NSERC. **Under no circumstances** should EG members divulge to anyone the recommendations emanating from the February competition or relating to appeals subsequent to the competition.

10. Activities for March and April

10.1 Communication with Applicants

Requests from applicants for an explanation of the results of the competition must be redirected to NSERC. If approached by researchers, Evaluation Group (EG) members should tell them that NSERC requires that all enquiries about individual cases be sent to NSERC, and that EG members are not permitted to discuss the deliberations specific to any case. EG members may wish to point out that NSERC regulations require them to leave the room during discussion of a colleague's application.

This policy has been developed as a result of such experiences as:

- requests from a number of senior university administrators to present a single, coherent message to grantees/applicants, and reduce the time wasted in what is often misinterpreted rumours;
- serious complaints from EG members being bombarded by telephone calls;
- applicants playing one committee member off against another;
- oral comments being taken out of context, or misinterpreted, and then fed back to NSERC as a complaint against the EG;
- disagreement between the written EG comments and the "grapevine";
- appeals launched on the basis of the oral comments of an EG member.

10.2 Finalization of Messages to Applicants

The program officer reviews all messages to applicants. This step ensures that any feedback to applicants is consistent with NSERC policies and guidelines, and is clear and detailed enough to be useful to the applicant in preparing future submissions. Occasionally, the program officer may identify problems with the comments and will discuss the case with the section chair. In some cases, the problem will be resolved by clarifying the comments with the author. In other cases, it may be necessary to review the basis for the recommendation and/or the recommendation itself. While these cases are rare, EG members may be consulted on such cases.

The section chair reviews and approves all messages to applicants before these are sent to researchers, to ensure that the comments reflect the consensus of the EG. All researchers, including those who do not automatically receive comments from the EG, will automatically be sent the referee reports. Researchers must not correspond with EG members or referees.

10.3 Annual Report

The EG annual report represents the formal record of the group chair's and section chairs' feedback on the competition and is distributed to members of NSERC staff and members of the

Committee on Grants and Scholarships (COGS) for information and follow-up. It is a key source document for policy discussions of COGS. Occasionally, the EG annual report is distributed publicly to such groups as department chairs in a given discipline, professional associations, etc.

The EG annual report is prepared by the group chair and section chairs with assistance from the program officer and should be finalized in April. It should highlight:

- competition outcomes and the EG's general impression of the quality of proposals, evaluation criteria, pressures on the budget, issues of concerns and new areas of research;
- comments and recommendations on policies and procedures. These could include, but are not limited to, feedback on program philosophy and objectives, and their link to the optimal use of resources for the support of sciences and engineering;
- trends and issues within the discipline, comments on program delivery mechanisms, program literature and forms, and identification of research suitable for public relations efforts;
- competition statistics that may be included as an appendix to the annual report or within the body of the report. As these numbers and statistics do not represent the final and official results of the competition (these are to be prepared for the May meeting of the Committee on Grants and Scholarships), a disclaimer to that effect will appear on the first page of the report and also on these appendices;
- additional topics relevant to the EG.

10.4 Membership

Following the February meetings, program officers will formulate recommendations for new appointments to the EGs. These recommendations include comments on the background, stature and experience of nominees, as well as references on their suitability to participate in the peer review process and work in a committee setting. Factors such as the nominee's involvement in cross-disciplinary and collaborative research may also be considered. Past EG members may be approached by the program officer to provide such comments and references.

11. Legal and Ethical Issues

11.1 *Canadian Environmental Assessment Act, 2012*

Note: On July 6, 2012, the Canadian Environmental Assessment Act, 2012 (CEAA 2012) came into force. As a result, the *NSERC Policy on Environmental Assessment* and the environmental assessment (EA) review of applications submitted to NSERC are being revised. As an interim measure, grant applicants are required to provide more specific information under Appendix A, but are no longer required to complete Appendix B.

Applicants must complete an Environmental Impact statement (Appendix A of an Application for a Grant [Form 101]) if any of the proposed activities take place outdoors and a) outside of Canada; or b) on "federal lands" in Canada as interpreted in section 2(1) of the Canadian Environmental Assessment Act, 2012 (CEAA 2012); or c) directly support or enable any activity(ies) listed in the Regulations Designating Physical Activities, CEAA 2012.

The information in Appendix A of Form 101 allows NSERC EA staff to determine whether or not the proposal should be referred to the Canadian Environmental Assessment Agency for a more in-depth environmental review. This may be necessary if the project involves the construction, operation, modification, decommissioning, abandonment, or other activity in relation to a built structure that has a fixed location and is not intended to be moved frequently; or if it is linked to any activity(ies) listed in the *Regulations Designating Physical Activities*, CEAA 2012.

While there are many changes in both the legislation and EA review process, potential environmental impacts of proposals will still be assessed by NSERC EA staff in parallel with the peer review process.

It is possible that applicants will submit proposals that may have a negative impact on the environment, but are not subject to the CEAA 2012. These will be evaluated on a case-by-case basis. In such instances, the NSERC EA staff may contact experts in various relevant fields to comment on the appropriateness of the proposed methodologies, mitigation measures, etc. Any guidance or advice received from these experts will be forwarded to the applicants, if required.

11.2 Confidentiality of Application Material

Members appointed to the EG, are asked to read and sign the Declaration for Members of NSERC Selection Committees (Form 251) describing NSERC's expectations and requirements.

All application material is provided to EG members in strict confidence and must be used for review purposes only. Such material should be kept in a secure place that is not accessible to colleagues or students.

Members are asked to leave their application material/USB key (except their personal notes) at the competition centre for disposal by NSERC. If NSERC requires assistance to provide additional information for particular cases after the competition (e.g., for an appeal case), the relevant information will be provided to the members. The material members still possess after the end of their term on an EG (e.g., their personal notes on applications reviewed) must be destroyed by a secure process, e.g., by deleting electronic data files, shredding or burning paper, or arranging their return to NSERC.

11.3 Communication with Applicants

Members are asked **not** to enter into direct communication with applicants to obtain additional information on their proposals. Members are asked to contact the program officer if they require further information. They are also asked to refer all enquiries from applicants to NSERC; staff will act as liaison between the EG and the applicants.

11.4 Code of Ethics and Business Conduct

NSERC has adopted a Code of Ethics and Business Conduct for members of NSERC Standing and Advisory Committees, and a Declaration for Members of NSERC Selection Committees (Appendix 2). These documents were designed to enhance public confidence in the integrity, objectivity and impartiality of its EG members. They require individuals on NSERC's standing committees, EGs and panels to practice ethical behaviour and to disclose real, potential or apparent conflicts of interest, and to abide by any compliance measures that the president, or the president's delegate, determines are required.

Council By-Law II states that, when an NSERC EG or panel assesses a specific application for an award, members who are directly or indirectly associated with the application must disclose their interest and follow guidelines adopted by NSERC regarding conflicts of interest. Members of any NSERC EG or panel who stand to gain or lose financially, either in their personal capacity or by virtue of being an officer of any legal entity affected by a policy or financial decision of NSERC, must disclose their interest.

11.5 *Privacy Act*

In general, personal information means any information about an identifiable individual. Based on the *Privacy Act*, personal information provided to NSERC by applicants must be used only for the purpose of assessing NSERC applications, making funding decisions and for certain related uses described to applicants by NSERC at the time that their personal information is collected. Members are reminded that the use or disclosure of this information for any other purpose is illegal.

In most cases, NSERC must collect personal information directly from the individual to whom it relates. NSERC may collect it from other sources, such as external reviewers, only as part of the formal peer review process. For this reason, EGs must not use or consider information about an applicant that has been obtained in any other way, for example, by an EG member by virtue of his/her involvement in non-NSERC activities.

An applicant has the legal right to access personal information in NSERC files, including, for example, the full texts of referee reports or EG feedback. The *Privacy Act* allows NSERC to edit a peer reviewer's name from a review before disclosing it to the applicant; however, lists of EG members are published regularly by NSERC, so applicants know who the EG members are.

It is important for EG members to adhere strictly to the guidelines set out in the Declaration for Members of NSERC Selection Committees (Form 251).

11.6 *Canadian Human Rights Act*

The activities of NSERC are subject to the *Canadian Human Rights Act*. The purpose of the Act is to give effect to the principle that every individual should have equal opportunity with other individuals to make the life that he or she is able and wishes to have, consistent with the duties and obligations as a member of society, without being hindered or prevented from doing so by discriminatory practices.

For all purposes of the Act, race, national or ethnic origin, colour, religion, age, sex, marital status, family status, disability and conviction for an offence for which a pardon has been granted are prohibited grounds for discrimination. Where the grounds for discrimination is pregnancy or childbirth, the discrimination is deemed to be on the grounds of sex.

It is a discriminatory practice to deny a service to an individual, or to differentiate adversely in relation to any individual in the provision of that service.

11.7 *Official Languages Act*

NSERC, like all other federal institutions, has a key role to play in the implementation of the *Official Languages Act*. NSERC has an obligation to ensure that:

- the public can communicate with, and receive services from, the agency in either official language; and
- the work environment can accommodate and is conducive to the effective use of both official languages by its employees and Council members.

NSERC ensures that its EGs or panels and staff are fully aware of their obligations and rights regarding official languages by providing documentation on official languages to employees and Council members and by including relevant guidelines in the instructions to EGs and panels.

In accordance with its active offer of bilingual service to the public, NSERC strives to appoint an appropriate number of experts with the appropriate language capabilities to serve on EGs and panels. EGs and panels visiting francophone researchers must ensure that meetings can be conducted in French. If required, an NSERC staff member will accompany those visiting teams that foresee difficulties in this regard. EGs must ensure that all applications receive a full and detailed evaluation, regardless of the official language of presentation. On occasion, this may entail consultation with NSERC staff to identify EG members or referees with adequate linguistic capability.

In accordance with its active offer of bilingual service to the public, upon request, NSERC will provide the service of simultaneous translation for the EGs during the February meetings. EG members who wish to make use of this service should advise NSERC well in advance of the meeting to allow for the preparations.

11.8 Responsible Conduct of Research

Canada's federal granting agencies—Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council of Canada (NSERC), and Social Sciences and Humanities Research Council of Canada (SSHRC)—are committed to fostering and maintaining an environment that supports and promotes the responsible conduct of research. The new Tri-Agency Framework: Responsible Conduct of Research sets out the responsibilities and corresponding policies for researchers, institutions, and the agencies that together help support and promote a positive research environment.

Committee Member's Role

The agencies expect the highest standards of integrity in the research that they fund and in the review process they manage. The electronic submission of an application to the agencies commits the applicant(s) to a number of principles, including compliance with the *Tri-Agency Framework: Responsible Conduct of Research*. **Should members identify, during the evaluation process, what appears to be a lack of integrity** (e.g., a misrepresentation in an agency application or related document—such as providing incomplete, inaccurate or false information)**, they should bring their concerns to the attention of agency staff at the earliest opportunity**. The agency will then refer any allegations to the Secretariat on Responsible Conduct of Research for follow-up. Such allegations should not be a consideration during the review process, nor should they be part of the committee's evaluation discussions.

Committee members who raise concerns should rest assured that the matter will be addressed by the Secretariat in accordance with the *Tri-Agency Framework: Responsible Conduct of Research*; however, members will not be privy to the outcome of the matter, as the findings are confidential and no personal information is shared.

In addition, committee members should notify the agencies of any conflict of interest—financial or otherwise—that might influence the agencies' decision on what applications

the members can review. Committee members and referees are responsible for respecting the confidentiality of application material and for declaring conflicts of interest. Should committee members become aware of a situation that violates the integrity of the review process, they should discuss this immediately with agency staff.

11.9 Procedures for EG/Panel Members under Investigation

Members of an NSERC EG or panel who find themselves in the position of having to respond to formal allegations of financial or professional impropriety **will not** participate in the work of the EG or panel while an investigation is under way.

11.10 Ethical and Other Considerations

NSERC requires that researchers adhere to a number of policies and guidelines governing research in particular areas:

- Research requiring the use of animals
- Research involving human subjects
- Research involving human pluripotent stem cells
- Research involving controlled information
- Research involving biohazards
- Research involving radioactive materials
- Research that potentially has an effect on the environment

These are described in the section "Requirements for Certain Types of Research" in the NSERC *Program Guide for Professors*.

It is the responsibility of NSERC staff, with the support of administrators from research institutions, to ensure that the researchers adhere to these guidelines. However, reviewers must alert NSERC to any potential ethical concerns or problems that are observed in information sessions or during the evaluation process. Here are some examples:

- Inadequate sensitivity to the potential concerns of human subjects and/or inadequate provisions for the participation of human subjects in experiments, as required by the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*
- Use of animals in experiments where the significance of the proposed research does not appear to justify either the use of animal subjects or the proposed experimental protocol Inclusion of controlled information in an application
- Inadequate training of graduate students in the handling of hazardous chemicals or biological substances
- Potentially harmful effects on the environment, or an inaccurate or incomplete assessment of these effects.
- Research that involves the use of human pluripotent stem cells where the applicant has not checked the "yes" box on page 1 of Form 101

If an EG or panel raises serious ethical concerns, these concerns should be discussed immediately with NSERC staff to determine if there is a means of resolving any apparent problems quickly, or if the release of any grant funds should be delayed pending resolution of the problem.

Appendix 1

Guidelines Governing Membership of Selection Committees and Panels

The following criteria and guidelines govern the appointment of members of NSERC selection committees and panels. These guidelines were approved by the three program standing committees (Committee on Scholarships and Fellowships, Committee on Research Grants and Committee on Research Partnerships) and presented to NSERC's Council at its June 2001 meeting.

Composition

In order to perform its task efficiently and equitably, each selection committee or panel must represent diversified expertise in the areas of research covered by the committee or panel and have good judgement and a broad knowledge of the areas, including new and emerging ones that are often at the frontier between disciplines, and an ability to assess the potential contribution of the proposals against the objectives of the program.

Selection committees and panels are peer based. Although the majority of panel members are drawn from Canadian universities, committees and panels should include research managers, experienced practitioners (those with hands-on experience) and researchers from industry, government laboratories and/or foreign institutions. Recently retired individuals who remain very active in research are potential members.

Members from the private and public sectors provide an important perspective in the assessment of applications. Their participation in the review process can enhance awareness and appreciation of the value of applied research and the potential for application of basic concepts to technology transfer or, where appropriate, commercialization. Members from the private and public sectors can offer an understanding of the potential exploitation of research results in commercial operations.

Members from outside the Canadian university system provide valuable contributions and help bring fresh ideas to the process. This is particularly important in relatively small disciplines, or in areas where Canadian expertise is concentrated in only a few institutions.

In addition to bringing an international perspective, foreign members bring with them valuable experience with other peer review systems and research communities.

Although each committee or panel should be representative of the community it serves, members should not be considered representatives of their university, industry or government department.

Potential members include accomplished researchers, new scientists and engineers from all sectors and all universities, large or small. Members need not be NSERC grantees. Scholarships selection committees should also include postdoctoral fellows.

Because of the diversity of the population of Canada and of the research community, other factors need to be taken into account to ensure equitable representation of various groups. For example, both women and men should participate in the selection process, the various fields of research under the purview of a committee must be adequately represented over time, the different regions of Canada must participate fully in the selection process and each committee must be able to assess applications in Canada's two official languages.

Membership Dynamics

To maintain a certain stability in membership while providing a mechanism for membership renewal, NSERC has established a rotation pattern based on three-year terms for committee and panel members. These terms represent an appropriate balance between giving members time to become familiar with policies and procedures and time to deal with the workload. Three-year terms also address the need for renewal, so that it is not always the same people involved in the review process. Inasmuch as possible, one third of the membership should be replaced each year.

Roles and Responsibilities for Appointments

Selection committee and panel members are appointed by the Corporate Secretary to Council, upon co-approved by the appropriate Director and/or Vise-President. In developing recommendations, Program Officers, in consultation with Team Leaders and/or the Director:

- review nominations from the universities, professional and learned societies and the committees or panels themselves;
- consult the selection committees and panels (including the incoming Chair) on their perceived needs for the short and medium term and on the suitability of nominations received; and
- consult advisors, including the Chair of the Committee on Research Partnerships, to seek references on the suitability of nominees.

The committee and panel chairs are appointed by NSERC, generally from the continuing members of the committee or panel.

Guidelines for Nominators, Panels and NSERC Staff

It is essential that committees and panels examine trends in research and lend special consideration to planning their expertise requirements for the next three years, noting particular pressures, or changes in direction of research; it is important to recommend the

appointment of new members to cover new or priority areas. One-for-one replacement is not always appropriate.

Prime considerations in the renewal of membership are the nominees' stature in the research community, their areas of expertise and breadth of interest, their good judgement and their ability to work on a committee or panel. In addition to the requirements of competency and being representative of the community the committee or panel serves, the following guidelines are taken into account in considering nominees:

1. Each committee or panel must have the capability to review applications in Canada's two official languages. In addition to recruiting a minimum of two members whose first official language is French, committees should have as many bilingual members as possible.
2. Each committee or panel should reflect the gender balance of the community it represents and, if possible, include a minimum of two women and two men.
3. The extension of a term for one additional year may be accepted in exceptional circumstances, for example in situations where a disproportionately high turnover of membership occurs.
4. Individuals who have previously served on a selection committee or panel may be re-appointed to that same committee or panel to ensure the necessary stature or to satisfy other guidelines. However, a minimum of four years should elapse before re-appointment.
5. Consecutive representation from a given institution should be avoided. Exceptions may occur if there is a concentration of excellent researchers in a few large departments or if other guidelines cannot otherwise be satisfied.
6. Except in unusual circumstances (e.g., when a member moves or areas of research are rearranged between panels), the simultaneous membership of two persons from the same university on a committee or panel is not permitted. Because of conflict of interest guidelines that preclude members from being involved in the review of applications from their own institution, the committee or panel would be short two members when applications from that institution are reviewed.
7. Individuals from the university sector whose duties include fund-raising for research and co-ordination of research contracts or the selection of PGS applications submitted to NSERC cannot be considered for membership on a selection committee or panel, as their functions put them in the position of a real or perceived conflict of interest. These groups include Research Grants Officers, Directors of Research Offices and Vice-Presidents (Research) for grants selection committees and panels, and Scholarships Liaison Officers and Deans of Graduate Studies for scholarships and fellowships committees. Such individuals may, however, be considered for appointment to NSERC standing committees, where the principal function is policy development.
8. Members should be drawn from the various regions of the country and from large and small institutions.
9. Representation from outside the Canadian academic community is important. This includes the Canadian public and private sectors, and also researchers from foreign institutions. Committees and panels should have at least one person from an institution other than a Canadian university. Canadians or ex-Canadians

working abroad are generally valuable participants in the NSERC peer review system. The balance of university, private and public sector members changes from committee to committee or panel to panel and reflects the nature of the fields covered by each committee or panel, or the need for consideration of the application of research results. Some committees or panels will require a larger representation from outside the academic sector than others.

Recommendations not consistent with the guidelines, as well as recommendations for a change in the size of the committee or panel, must be fully documented.

Note: Committee or panel members who find themselves in the position of having to respond to formal allegations of financial or professional impropriety will not participate in the work of the committee while an investigation is under way.

Appendix 2

DECLARATION FOR MEMBERS OF NSERC SELECTION COMMITTEES[1]

Statement on Ethics

NSERC must meet the highest ethical standards in all that it does in order to continue to merit the trust and confidence of the research community, the government and the public at large. The members of NSERC selection committees and panels must meet very high standards of ethical behaviour in their task, and must be seen to do so in order to honour and enhance public confidence in the Council's ability to act in the public interest and for the long-term public good. Where a conflict arises between private and public interests, members will be expected to take whatever measures are necessary to ensure that public interests are protected.

The members of NSERC selection committees and panels are appointed as individuals; they are not the advocates or representatives of their disciplines, nor are they the delegates of any organization. Their duty is to make the best possible objective decisions on the investment of a fixed sum of scarce public funds in basic research, based on the merits of the cases made to them.

Conflict of Interest

Because of the technical content of the issues they must address, the selection committees and panels must have members who have current knowledge of the issues in research. However, the activities which maintain that current knowledge could put individual members in situations of real, potential or perceived conflict between their private interests and their public duties as committee or panel members. If that should happen, there will be full and open disclosure, and the committee or panel as a whole will take whatever measures are required to ensure ethical behaviour and to preserve the appearance of ethical behaviour.

NSERC recognizes that the potential for conflict of interest will always exist when expertise and current knowledge are required to judge among competing proposals in research. To attempt to devise rules that would eliminate all potential for conflict of interest would be to risk reducing vision and expert judgment to a bureaucratic exercise. The challenge is to recognize that conflict is always possible, and to be ready to manage it so that the ultimate outcome is in the public interest. NSERC has established conflict of interest guidelines for members of selection committees which can be found in the relevant sections of the program's *Peer Review Manual*.

Disclosure and Compliance Measures

NSERC recognizes that the first guardian of ethical behaviour in such circumstances is the individual committee member involved. The second guardian is the committee as a whole. Rules of disclosure and procedure can assist members meet their obligations, but only if they choose to invoke them and to follow them both to the letter and in the spirit in which they were formulated. Members must openly disclose any real, potential or perceived conflict of interest. The committee will then discuss with the Chair what measures, if any, are required to ensure that the public interest is protected. The Chair may seek guidance from NSERC staff before coming to a conclusion.

Disclosures and compliance measures will be documented and retained for the record. However, given their particularly sensitive mission, the selection committees and panels might consider these rules as only minimally adequate for their purposes, and may choose to add to them.

Confidentiality and Non-Disclosure

Documentation provided by NSERC to members of selection committees may contain personal information and confidential technical information. It is subject, therefore, to the *Access to Information Act* and the *Privacy Act*, www.nserc.gc.ca/professors_e.asp?nav=profnav&lbi=p1, the *Tri-Council Policy Statement: Integrity in Research and Scholarship*, http://www.nserc-crsng.gc.ca/NSERC-CRSNG/Policies-Politiques/tpsintegrity-picintegritie_eng.asp , and the *Government Security Policy*, www.tbs-sct.gc.ca/pubs_pol/gospubs/TBM_12a/gsp-psg_e.html. Documentation must be treated as strictly confidential.

[1] Committees includes groups and panels

1) Peer review documentation provided to committee members must be used by the appointed committee members only for the purpose for which it was originally collected, i.e., assessing NSERC applications and making funding decisions. It must not be used for any other purpose or discussed with, or disclosed to, non-committee members.
2) Committee members must ensure that NSERC documents in their possession are stored in a secure manner to prevent unauthorized access. They must be transmitted using secure techniques and when they are no longer required they must be destroyed in a secure manner, e.g., by deleting electronic data files, or by shredding or burning paper, or arranging for their return to NSERC.
3) Committee deliberations are confidential. Comments made by individual committee members during the meetings and during the ranking of applications must never be discussed or disclosed. In programs where consensus committee comments on specific applications are recorded, NSERC staff will provide such comments to the applicant(s). Until competition results are announced officially, they must remain confidential. The President must approve the recommendations of selection committees before the names of successful applicants and details of awards are released to the public. The names of applicants whose applications were not recommended for support, or who were declared ineligible, are never made public by NSERC and must not be divulged by committee members.
4) Enquiries received by committee members from applicants about the review of their applications must be referred to NSERC staff. There must be no direct communication between applicants and committee members on matters arising out of peer review.

I have read and understood the above and the relevant sections of the program's *Peer Review Manual* on conflicts of interest.

I understand that abrogation of these provisions may result in a review of the matter and that NSERC reserves the right to take appropriate actions including, but not limited to, requiring that I step down from the committee and the removal of my name from NSERC's database as a potential peer reviewer. The person to whom the information relates may seek civil action against me.

I agree to take personal responsibility for complying with these requirements.

Name (please print)	Signature
Committee Name	Date

In order for NSERC to be able to provide you with information for peer review, we ask that you return this form at your earliest convenience to the Program Officer responsible for your committee:

NSERC
350 ALBERT STREET
OTTAWA ON K1A 1H5

Appendix 3

Guidelines on Conflicts of Interest

The following compliance measures have been in use by NSERC committees for several years. These measures do not necessarily respond to all possible situations, and Council relies on the judgment of the committee members in developing measures that resolve real, potential, or apparent conflicts of interest in the public interest.

I. Council

Members who would be affected by a policy or financial decision of Council should clearly state the conflict of interest and Council should take appropriate action.

II. Standing Committees of Council

These are basically policy-making committees. Should a conflict of interest arise, the member concerned must declare such conflict and the committee will decide on whether or not that member may participate in the discussion and vote.

However, when a standing committee acts as a selection committee, any member in a conflict of interest must disclose the conflict in advance. The committee should then follow appropriate compliance measures (see below for examples of current practices). If a member who has to withdraw from discussion is the only member of the committee with expertise in the area under review, the committee may consult other experts.

III. Selection Committees and Panels (Grants and Senior Fellowships)

Individual and Small Group Grants

A member **must not** be assigned the application for review and **must** leave the room before discussion of the application without commenting:

- when the member is the applicant, co-applicant or co-signer, or is from the same university/company/department, or belongs to the same research unit as the applicant; or
- when there is an administrative or family link between the member and the applicant (e.g., head of the department, dean of the faculty, etc.); or
- when the member is an industrial or government representative directly involved in collaborative activities with the applicant; or
- when the member is uncomfortable with reviewing the applicant's proposal due to previous conflicts or any other reason; or
- when NSERC staff have reason to believe that the member should not be involved in the review.

For Discovery grants, applications from committee members must be reviewed in the presence of the Group Chair (or delegate).

For Research Tools and Instruments Grants, the final ranking of applications must be done in the absence of members with an application in the competition.

Large Group or Large Equipment Grants

For large group proposals or large equipment requests involving several departments in several universities, a member from the same institution as one or several of the co-applicants may be allowed to participate in the discussion and vote, even if one or several co-applicants are from the member's university. The following process is to be used in such cases.

Well before the meeting, NSERC staff will attempt to identify potential conflicts of interest to avoid placing members in an uncomfortable position; at the beginning of a session, the Chair will read the list of identified conflicts and will also ask each member in turn to declare any other relationship to a proposal (positive or negative). If the Chair believes that a member should not participate in the review, that member should withdraw from discussion and voting.

When the committee (or the Chair) has difficulty dealing with a particular situation, it should be brought to the attention of NSERC staff who are responsible for making the final decision on compliance measures.

IV. Scholarships and Fellowships Selection Committees (Graduate and Postdoctoral Level)

If a student applying for an award is under the direct supervision of a committee member, the member should leave the room and abstain from discussion and voting; if the student is from the member's department, the member may remain in the room but should not participate in the discussion and voting.

When the guidelines do not clearly describe a situation, or when the committee (or the Chair) has difficulty dealing with a particular situation, it should be brought to the attention of NSERC staff who are responsible for make the final decision on compliance measures.

V. Investors in Participating Companies

When a committee member is an investor in a company that is a partner in, or contributor to, a project or program being considered for an NSERC grant, the member should disclose this information to NSERC staff and not participate in the review of the application.

Appendix 4

Traveling on Behalf of NSERC

During your mandate as an EG member, you will be asked to travel on the following occasions:

- In November, new members will be invited to attend the Orientation Session for New Members that will be held in Ottawa.
- In November, EG Chairs will be asked to attend the Executive Committee Meeting, as well as participate in the Orientation Session for New Members that will be held in Ottawa.
- In February, all members will need to attend the competition sessions.

Your travel and living expenses, while on NSERC business, will be reimbursed by NSERC.

Below, you will find useful information regarding meeting and travel arrangements with NSERC.

1) NSERC's Travel Service Provider

Travel arrangements for all NSERC business are made through NSERC's Travel Agent, **Carlson Wagonlit by Global Travel Centre**. You may contact them:

- by telephone at 613-238-0000 or 1-800-267-1264;
- by fax at 613-238-8033; or
- by e-mail at global@globaltravel.ca

There are several advantages to this mode of operation for you as well as for NSERC, including the following:

- NSERC is billed directly for the travel and hotel costs; you do not need to pay first and be reimbursed after the meeting.
- Members receive an automatic $600,000 air flight accident insurance ($500,000 from AMEX and $100,000 from Carlson Wagonlit by Global Travel Centre).
- NSERC qualifies for significant volume discount rates (through convention rates) and is able to minimize costs.
- Your travel costs are calculated prior to the meeting. An automatic reimbursement is then provided to you after the meeting.

You will receive details on travel arrangements prior to the meeting(s). Government employees, members using their own travel agent or renting a car, and contract members are required to submit a travel expense claim form along with original receipts for all charges submitted for reimbursement.

If you foresee incurring out-of-pocket expenses as a result of your NSERC activities, but separate from your attendance at meetings, discuss these with your Program Officer prior to the meeting.

2) Frequent Flyer Points

As of June 1, 2001, Treasury Board amended its Travel Policy to allow for frequent flyer points (e.g., Aeroplan for Air Canada and Air Miles for Westjet) to be collected from tickets purchased or reimbursed by the federal government. As we adhere to this Travel Policy, we are pleased to advise you that your frequent flyer membership number can be added to your reservation by our travel service provider to allow you to collect these points. Supply your membership number to Carlson Wagonlit by Global Travel Centre when making your next reservation.

Note: The reimbursement of tickets purchased with frequent flyer points will not be allowed. Benefits that have been earned in a travel loyalty program, as a result of business travel transactions that are paid or reimbursed by government, are taxable benefits when redeemed for personal needs. For further information on this matter, refer to the Canada Customs and Revenue Agency (CCRA) Interpretation Bulletin IT-470R (Consolidated) – Employees' Fringe Benefits. **The government will not issue a T4 or T4A slip in this regard. It is the responsibility of each member to report the applicable taxable benefit when completing their annual tax return.**

3) Electronic Ticketing

Most major airlines issue electronic tickets. Air Canada, Westjet and Porter Airlines offer on-line check-in 24 hours prior to departure. This can be done on the airline's Web site by entering your booking reference number and following the steps. Some airlines, such as Westjet and Porter, are ticketless and only require the booking reference number/locator.

How It Works
All passengers must proceed to the relevant airline counter or the kiosk to obtain a boarding pass before going through security and then the departure gate. You will need a government-issued photo identification for all domestic flights and should have a copy of the electronic ticket, if possible, when traveling. For international flights, you must go directly to the airline check-in counter or kiosk area, present your travel receipt (as well as proper documents such as a passport or visa), and then proceed through customs in the usual manner.

Note: Luggage fees may apply, especially when travelling on U.S. carriers.

If you forget your travel receipt, go to the relevant airline check-in counter and present photo identification. You will then receive your boarding pass and can proceed as usual to the departure gate.

Note for members not using NSERC's Travel Agent (Carlson Wagonlit by Global Travel Centre) : An electronic ticket (e-ticket) also serves as the "invoice" which provides confirmation, similar to a paper airline ticket, that travel has been purchased. The electronic ticket/invoice consists of the trip itinerary and a page entitled "Passenger Itinerary/Receipt" that includes additional invoicing details such as invoice number, date of issue, GST and the total airline ticket cost. These documents should be submitted in their entirety with your travel claims in lieu of a paper ticket receipt.

4) Seat Selection

It should be noted that advanced seat selection is not guaranteed for every booking. For instance, Air Canada blocks a number of its seats for airport check-in only; it also restricts many others for either the higher-paying passengers or Aeroplan members. So while every effort is made by our travel agency to get a seat for you in advance, this is not always possible.

Appendix 5

Policy and Guidelines on the Assessment of Contributions to Research and Training

An important evaluation criterion in any grants program is the excellence of the researcher. Applicants and co-applicants are assessed on the quality and impact of their contributions to research and training over the past six years, and on their stature, knowledge of their fields and demonstrated expertise.

Contributions to Research

The research process is not complete until the results are validated and transmitted to an appropriate target audience. For many disciplines, the most common and effective means of disseminating results is through the publication of articles in refereed journals. However, other means of dissemination exist, including transfer of technology to Canadian industry, and the onus is on the researcher to select the most appropriate vehicle to ensure maximum impact on the field.

Applicants and co-applicants in engineering and the applied sciences should read NSERC's Guidelines for the Preparation and Review of Applications in Engineering and the Applied Sciences for specific indicators of excellence and research contributions in these fields.

Assessment of Quality

The ultimate tests of quality of any research contribution or publication are its significance and use by other researchers and end-users, and the extent to which it influences the direction of thought and activity in the target community. Evaluation of this, while subjective, is a central element of peer review.

Applicants are asked to indicate their recent contributions on the Personal Data Form (Form 100) and may be asked to provide copies of, or documentation on, some of these contributions for the benefit of reviewers.

To focus the assessment of excellence of the researcher on the quality and impact of recent contributions to research, applicants are asked to identify up to five of their most significant

research contributions in the last six years and to explain how these contributions have influenced their field and/or the activities of users.

Selection committees and panels are advised by NSERC to neither rely on numbers of publications in their assessment of productivity nor create or use lists of "prestigious" or "unacceptable" journals in their assessment of quality. The quality of the publication's content is the determining factor, not that of the journal in which it appears, and the onus is on the applicant to provide convincing evidence of quality.

Forms of Publication

There are many valid types of publications, including: articles, communications, monographs, memoirs or special papers, review articles, conference/symposia proceedings and abstracts, government publications and reports documenting industrial contributions and contributions to engineering practice. Each type has its place and advantages, and there is much variation between and within disciplines.

NSERC advises its selection committees and panels to evaluate the quality and impact of all contributions and not to regard some as "second class" or "grey literature."

Some fast-moving research fields use special means to reach the target audience quickly. Communications, quick print reports, letters, and even broad distribution of preprints are important vehicles for disseminating research results.

Contributions to Collaborative Research

Some researchers do most of their work in a collaborative mode. Publications are often prepared jointly with students, postdoctoral fellows, or other research collaborators. Applicants should describe their intellectual contribution to collaborative work or joint publications in their Form 100. The assessment of a researcher's excellence must fully take into account the overall quality and impact of these collaborative activities.

Delays in the Research and in Dissemination of Research Results

From time to time, situations may arise that make it impossible or undesirable for researchers to publish important results of their research prior to reapplying for NSERC support. For example, the time required to complete a monograph may exceed the time available between consecutive applications, or publication may be delayed to allow technology transfer or patent protection.

NSERC recognizes that research productivity may vary during periods of pregnancy or early child care, whether or not a formal leave of absence was taken, or as a result of other personal circumstances. Administrative leave, disability and other situations may also result in publication delays.

Applicants should clearly and fully describe any circumstances that delay research or affect dissemination of research results in their Form 100. NSERC advises its committees to be sensitive to the impact of these circumstances on the level of productivity while ensuring that the quality of the research remains competitive. Each case is reviewed on its own merit.

Contributions to the Training of Highly Qualified Personnel

NSERC encourages researchers to participate in outreach activities and activities designed to engage students in the natural sciences and engineering, and to improve teaching and learning in these disciplines. There are several programs, such as PromoScience, the Centres for Research in Youth, Science Teaching and Learning (CRYSTAL) and the Chairs for Women in Science and Engineering (CWSE), in which the involvement of researchers will be recognized as a valuable contribution. Applicants should list these activities as part of their contributions to research and training.

Advanced training in science and engineering is an integral part of university research and of NSERC's mission to foster the discovery and application of knowledge. This training contributes to the availability of a highly skilled labour force, capable of thinking critically and creating and applying knowledge for the benefit of Canada. Individuals trained in science and engineering are ideally positioned to capitalize upon new ideas and technologies developed in Canada and elsewhere in the world, regardless of the sector in which they are employed. Professionals in science and engineering contribute to our national competitiveness and productivity, as well as to our understanding of the natural and physical environment and ourselves, leading to improvements in the standard of living and quality of life for Canadians.

Training supported by NSERC ranges from undergraduate theses and summer projects to the postdoctoral level, and includes technical and other research personnel. The level and content of the training should be appropriate to the research field, with opportunities for interaction and collaboration with other researchers inside and outside the university, where appropriate. Undergraduate student participation in final-year projects and summer projects is an important first phase in research training and plays a major role in encouraging excellent students to pursue

research careers. For technicians and others who have been in long-term positions, the acquisition of new techniques and knowledge is an important contribution to training. In collaborative research involving non-university partners, student training may be enhanced by an exposure to an industrial work environment. Similarly, industry personnel can benefit from being involved in academic research.

NSERC also recognizes that not all research is appropriate for training and there will be circumstances when training will be limited. In these cases, the onus is on the applicant to provide an explanation of the absence of a training component.

The fact that an applicant has trained, is training, or plans to train students, technicians, or postdoctoral fellows, is not in itself a sufficient rationale for awarding a grant. A researcher's contribution to training will be assessed in terms of its quality and impact, and not solely in terms of the number of people supervised.

It is expected that most trainees supported from a grant will produce theses and other high-quality contributions to knowledge and will move on to professional careers in fields related to science and engineering in all sectors.

The following questions will be used as a guide by selection committees and panels when assessing your involvement in research training:

From information provided on the Form 100:

Have the resulting contributions been of high quality?

- Have the students and other personnel gone on to further research training positions (e.g., PhD program, postdoctoral position)?
- Have the people trained by the applicant gone on to become respected professionals in fields related to science and engineering, in any sector? Examples of professional contributions:
- Transferring new knowledge and expertise from the universities to the Canadian private sector;
- Starting businesses, creating jobs and new economic opportunities;
- Maintaining Canada's international competitiveness in research in science and engineering, renewing our intellectual resources

- Developing and implementing policies, standards and regulations on issues of national interest; or
- Maintaining and enhancing the national framework for competitive R&D through teaching, administration and research dissemination.
- In the context of the research field and the applicant's capabilities, is the past level of training activity appropriate? If not, has appropriate justification been provided?
- What was the applicant's role in the training of the different types of HQP?

From information provided in the application:

- Are the projects feasible and appropriate for the training proposed?
- Will trainees be able to make an original contribution to knowledge?
- What opportunity will there be for training in a collaborative or interdisciplinary environment, if appropriate?
- What opportunity will there be for trainees to work with other sectors, if appropriate?
- If little or no training is planned, has an appropriate justification been given?

Appendix 6

Guidelines for the Preparation and Review of Applications in Engineering and the Applied Sciences

Engineering is concerned with the application of knowledge for practical purposes, wealth creation and quality of life. It is recognized that engineering is very broad and includes a wide range of research areas. Research in engineering ranges from the creation of fundamental new knowledge through to novel design or innovative approaches to improve existing processes, products and services capable of major improvements in performance. The same is often true for research in the applied sciences.

The indicators of excellence in and contributions to research in engineering and the applied sciences reflect the different nature of that research and may be significantly different from those in the natural sciences. Specific guidelines have been issued by NSERC for use by the research community in preparing applications and by selection committees and panels that review applications in these areas.

All NSERC research programs include among their selection criteria:

- the excellence of the applicant and any co-applicant; and
- the merit of the proposal.

The following guidelines address these two criteria with respect to engineering and the applied sciences. It should be remembered that there are other criteria which must also be addressed. Refer to the Review Procedures and Selection Criteria for the applicable program.

The Excellence of the Applicant(s)

The assessment of excellence is based on the expertise and track record over the past six years of the applicant and co-applicant(s), focusing on their contributions to and impact on the field and profession. In the case of new researchers, less emphasis is placed on their track record; however, it is important that their potential for research be clearly demonstrated in the application.

Significant Research Contributions and Practical Applications

Contributions in engineering and the applied sciences may take the form of any of the following. All applicants are expected to demonstrate excellence in these contributions:

- **Dissemination of knowledge through the open literature:** refereed journal publications, conference proceedings, monographs, and books.

- **Evidence of specific application of knowledge and improvements to current practices:** improvements in products, processes, services, designs,

transfer of knowledge through technical and internal reports on new processes to practitioners, work on the establishment of national and international standards, work incorporated into a recommended practice or code.

- **Evidence of the creation of novel products, processes and services that are or may become useful to society:** patents, technical licensing, technological innovation (e.g., the creation of computer software packages, development of new genetic lines from plant or animal breeding, development of innovative technology that is being implemented at commercial or industrial scales), innovative formulation of operational principles for the design of practical processes, development of viable spin-off companies, and joint ventures.

- **Other evidence of contributions to the profession or impact on the field:** membership on committees that influence the direction of the field and the profession (e.g., code, selection committees, advisory boards, boards of directors, and professional boards and committees), research interactions resulting from collaborative projects, contributions to national or regional development, evidence of strategic management and planning, consulting, and research leave spent in industry, government or business.

Committees will assess the contributions as they relate to:

- quality;
- significance;
- innovation;
- relevance to the proposal;
- impact or potential impact on the industry, profession or society.

Many contributions to industry or other end-users take the form of **technical and internal reports**, some of which may be confidential to protect proprietary information. In such cases, the user of the contribution may write a letter to attest to its importance and cover the above aspects. Whether or not such a letter is provided, applicants should give the report title, the name of the recipient, the date submitted, a concise description including a summary of the results acceptable to the research partner, and an explanation of the technical significance of the work. Describe the importance of the industrial contribution in terms of the novelty and innovation of the research as opposed to the simple provision of a service, and explain how the work is related to the NSERC proposal.

Applicants should document the above information on the Personal Data Form (Form 100), making the strongest possible case in the space provided.

2. The Merit of the Proposal

This criterion is a composite of the following factors:

- originality;
- anticipated significance;

- clarity of long- and short-term objectives;
- suitability of proposed methodology;
- feasibility.

The major emphasis in engineering and applied sciences proposals is on the degree of innovative content of the research program or design activity and the potential to make a significant contribution to the field. Consideration is given to the potential for technological impact and the degree to which the proposal addresses present or future socio-economic needs. Applicants should discuss the importance of the specific problem being addressed and the potential applications of the research.

Appendix 7

Guidelines for the Preparation and Review of Applications in Interdisciplinary Research

Definition

Interdisciplinary research is "research that involves the interaction among two or more different disciplines" and occurs at the interface between disciplines. This may range from the sharing of ideas to the full integration of concepts, methodology, procedures, theory, terminology, data, organization of research and training. Multidisciplinary research draws on knowledge from different disciplines, but stays within the boundary of one primary field.[1] In this document, "interdisciplinary" is used to refer to both interdisciplinary and multidisciplinary research. For administrative purposes, NSERC defines interdisciplinary grant applications as those that require the selection of referees from more than one discipline, the establishment of a review panel with members from more than one discipline, or the expertise of more than one selection committee or panel in the peer review process.

Context

The ongoing trend for greater interdisciplinarity in many research areas is widely recognized internationally. Interdisciplinary research evolves to meet the demands of many societal, environmental, industrial, scientific and engineering problems that cannot be adequately addressed by single disciplines alone (see also Guidelines for the Preparation and Review of Applications in Engineering and the Applied Sciences). Significant advances in research and development in the natural sciences and engineering increasingly involve a number of diverse fields, including those in the social sciences, humanities and health sciences. Such advances can occur rapidly when people with vastly different experience come together and share their expertise. In fact, research conducted by industry and government is not usually organized along disciplinary lines; when collaborating with non-academic partners, interdisciplinary research is the norm.

Interdisciplinary research relies on the strength of established disciplines to provide sound theory and methodology. It pushes the traditional boundaries of disciplines, helps ensure their growth and vitality as new and emerging lines of inquiry are pursued, and may lead to the development of new disciplines. Other benefits include sharing resources and facilities, building teams and networks, and removing duplication of effort in research.

Barriers that inhibit interdisciplinary research and prevent the full realization of its benefits are also recognized internationally (e.g., discipline-based university departments and journals, lack of communication between disciplines, high-risk nature of the research, lack of critical mass in the community for the dissemination of results, peer review and recognition).

[1] OECD (1998) Interdisciplinarity in Science and Technology, page 4.

Peer Review

NSERC supports and promotes high-quality research in the natural sciences and engineering, including research that occurs at the interface between disciplines or that requires the skills of several disciplines. Our programs, policies and procedures are designed to break down barriers against interdisciplinary research.

In all programs, an important principle of peer review is to ensure that the evaluation process addresses the application content: interdisciplinary proposals should receive interdisciplinary review.

The majority of NSERC grant programs have selection panels and committees that are interdisciplinary, covering either a very wide breadth of research areas in the natural sciences and engineering, or specific interdisciplinary themes or research topics. (For example, the E.W.R. Steacie Fellowships Selection Committee reviews all proposals submitted to that program, whereas the Strategic Projects Selection Panel for Sustainable Energy Systems reviews proposals in this target area.) Committee and panel members come from diverse backgrounds and rely heavily on reviews from experts in many fields (e.g., external referees) to ensure that proposals are evaluated fairly. Depending on program requirements, these panels and committees review either disciplinary and interdisciplinary proposals or just interdisciplinary proposals. When both types are in the same competition, interdisciplinary applications can usually be reviewed in the same way as those that are more focused on a single discipline. More emphasis should be placed on the selection of referees, particularly when committee/panel expertise is thin in a given area. When additional review mechanisms, such as site visits, are used in some programs, the reviewers selected for these reflect the interdisciplinary nature of the proposal.

Regardless of whether selection committees and panels are organized along disciplinary or interdisciplinary lines, NSERC requires that their membership represent diversified expertise in the areas covered by the committee or panel, including new and emerging ones that are often at the frontier between disciplines.

In cases where the research falls under the jurisdiction of more than one federal granting agency (NSERC, CIHR, SSHRC), special mechanisms exist for joint review and funding (see "Selecting the Appropriate Federal Granting Agency and Addressing Other Sources of Funding). These mechanisms can be used in all NSERC grant programs.

In the review of interdisciplinary proposals, special attention should be paid to the following:

- Selection of referees who are involved or familiar with interdisciplinary research. Additional referees should be sought to cover the range of research areas in the proposal.
- The peer review process should not create additional hurdles for interdisciplinary proposals in comparison to disciplinary proposals. Where needed, additional peer review mechanisms (e.g., site visits, sub-committees, consultations between committees) should be used to ensure the completeness and fairness of the peer review process.
- Some differences are inherent in interdisciplinary research: it may require a longer time frame; proponent(s) may lack a track record in a new, developing area or in an area new to them; and it may call for a more collaborative approach.

- As always, the evaluation of the quality and impact of research contributions should be of primary importance and not the journal in which the publication appears, or the vehicle used for disseminating results. Interdisciplinary journals that focus on new and emerging areas may not be as mature or as well known as more established discipline-based ones.
- The proposed research and the applicant's contributions should be assessed in the broader context of interdisciplinary research and not just in the narrower context of the reviewer's own discipline and research interests.

Selection committees and panels will consider the following when assessing interdisciplinary applications:

- What is the "added value" of the interdisciplinary approach? Will new knowledge from the interdisciplinary research have an impact in different fields, or are technologies and methodologies from different fields being used to further knowledge in one discipline?
- Have the perspectives of all relevant disciplines been considered in defining questions, methodology to be used, etc.?
- Does the applicant(s) demonstrate an understanding of the core problems and basic theoretical assumptions of the other fields involved?
- Is the terminology used clearly explained to audiences from different disciplines?
- Is all the required expertise available?
- For collaborative research, is there clear leadership, coordination and communication?
- Is there sufficient time to complete the research?

Discovery Grants

For the Discovery Grants Program, the Evaluation Groups (EG) are generally discipline-based. However, the purview of the EG and the expertise available on it may be broad enough that some interdisciplinary proposals can be reviewed fairly through this mechanism. When applications cross the boundaries of two or more discipline-based EGs, measures are taken to ensure fair evaluation (e.g., joint reviews involving two or more EGs, broader selection of referees).

Discovery Grant applicants who believe their proposal will benefit from interdisciplinary review should indicate which EG(s) they think is the most appropriate for the review and are encouraged to enter up to four additional research topics if their research overlaps with other areas or disciplines. NSERC makes the final decision on evaluation group assignment.